

## **Historic, Archive Document**

Do not assume content reflects current scientific knowledge, policies, or practices.



280.39

9842

pp. 2  
[redacted]

A Summary of Current Program, 9/30/64  
and Preliminary Report of Progress  
for 10/1/63 to 9/30/64

U. S. DEPT. OF AGRICULTURE  
NATIONAL AGRICULTURAL LIBRARY

MAR 29 1965

CURRENT SERIAL RECORDS

MARKETING ECONOMICS DIVISION

of the

ECONOMIC RESEARCH SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE

This progress report of USDA and cooperative research is primarily a tool for use of scientists and administrators in program coordination, development and evaluation and for use of advisory committees in program review and development of recommendations for future research programs.

The summaries of progress on USDA and cooperative research include some tentative results that have not been tested sufficiently to justify general release. Such findings, when adequately confirmed will be released promptly through established channels. Because of this, the report is not intended for publication and should not be referred to in literature citations. Copies are distributed only to members of Department staff, advisory committee members, and others having a special interest in the development of public agricultural research programs.

This report also includes a list of publications reporting results of USDA and cooperative research issued between October 1, 1963, and September 30, 1964. Current agricultural research findings are also published in the monthly USDA publication Farm Index. This progress report was compiled in the Marketing Economics Division, Economic Research Service, U. S. Department of Agriculture, Washington, D. C.

UNITED STATES DEPARTMENT OF AGRICULTURE  
Washington, D. C.  
October 1, 1964

## TABLE OF CONTENTS

	<u>Page</u>
Introduction .....	iii
Area 1. Market Structure and Costs .....	1
Area 2. Market Potentials for New Products and Uses .....	9
Area 3. Merchandising and Promotion Practices .....	19
Area 4. Distribution Programs .....	30
Area 5. Transportation Cost and Services .....	34
Area 6. Animal Products .....	40
Area 7. Fibers and Grains .....	52
Area 8. Horticultural and Special Crops .....	64
Line Project Check List .....	77

## INTRODUCTION

In 1963 consumers spent about \$67 billion for domestically produced food and about \$37 billion for nonfood products of farm origin. Between 70 and 75 percent of the value of food and nonfood products are added in marketing. The marketing of farm products, both domestic and foreign, constitutes a vital and growing part of the national economy. As the Nation's population grows rapidly, demands on the marketing system will rise, requiring increased efficiency at all levels. Improvements in marketing efficiency have and will continue to come through sound research into the problem areas that arise in moving food and fibers from producer to consumer.

The research program of the Division, although described by lines of work, is integrated and fitted together in a coordinated, comprehensive effort. Work in the different commodities and functional areas is planned and directed to form a coordinated attack on bottlenecks and inefficiencies that persist and creep into the marketing of farm products.

Another characteristic of the Division's program is its forward looking orientation. It seeks to interpret current changes and those likely to occur, providing a basis for intelligent decisionmaking by those responsible for marketing the output of our Nation's farms. By this research approach the system can be made more responsive to the needs of farmers and consumers, contributing in the utmost to a higher level of living for the American people.

As an outgrowth of last year's discussions with advisory committees, the Division is preparing a compendium of available economic knowledge about the agricultural marketing industry. A synthesis of information pertaining to economics of product quality and grade, farmers' bargaining power, changes in marketing structure and practices, market potentials for new products and uses, marketing margins, costs, and efficiencies, advertising, merchandising and promotion, etc., will provide a stronger basis for interpreting and forecasting future changes and their impact on consumers and farmers. Results of the synthesis will be released through technical publications, popular type articles, and a short documentary movie.

The research program of the Division is carried out by about 158 professional employees, with the necessary supporting help from the clerical and secretarial staffs. Of the professional staff, about 110 are in Washington, D. C., and the remainder are located at 32 field stations. Most of the field stations are at land-grant colleges with which the Division actively participates in cooperative research projects of mutual interest. In the past year, 38 cooperative agreements and 30 similar understandings between the Division and land-grant colleges or other institutions were in effect and operative.

Some of the research of the Division is conducted by contracts with other public and private organizations. Twenty-seven Research and Marketing Act contracts and five miscellaneous contracts were in progress or completed during the year. Also, the Division received trust funds from four nongovernmental organizations, a practice which is being encouraged to broaden the research program. Arrangements were made with other Federal agencies for fund transfers to assist in defraying costs of 11 special research studies. In addition to these formal arrangements, the Division has many contracts with private marketing firms and associations and with other research groups. Division personnel participate, for example, in the planning and reviewing of marketing research being conducted by approximately 30 regional research groups of land-grant college personnel.

Highlights of some studies completed or partially completed during the reporting period:

1. Price Spreads for Beef. -- The necessity for having readily available information on prices and price spreads at all levels of the marketing process is well illustrated by recent developments in the beef market. The existence of this information over a period of years made it possible for ERS to report and analyze current developments in prices and margins for beef during a period of marked public interest.

There is a long time upward trend in the margins for beef, similar to that for most food products but at a more rapid rate. In addition, there is a short-term cyclical movement of margins in response to changes in farm prices. Changes in retail prices tend to lag behind those in farm prices--in general, about the length of time it takes for beef to move through marketing channels. Retail prices tend to move more slowly than farm prices both upward and downward.

The biggest part of the increase in a farm-to-retail spread has been at the retail level. Retail margins have risen faster for beef than for other meats or for all foods. Apparently, retailers have responded to the surging demand for beef by shifting a part of the overhead of the store operation from other products to beef.

2. Marketing Spreads and Costs. -- The spread between the retail store costs and farm value of a market basket of farm-originated foods averaged about the same in the first 7 months of 1964 as in the same months of 1963. The marketing spread for the fruits and vegetables group was about 2 percent smaller than in 1963 and the spread for poultry and eggs was 1 percent smaller. These decreases, however, were a little more than offset by small increases for the other product groups. The retail store cost and farm value of the products in the market basket were about the same in the first 7 months of 1964 as in the same period of 1963.



The bill for marketing domestic farm-originated food products to civilian consumers in this country totaled \$46.8 billion in 1964, an increase of about 4 percent over 1963 and less than the average annual rise during the last 10 years. Both volume of food handled and unit marketing charges increased from 1962 to 1963. Retail food store prices increased less than 1 percent, but prices of food eaten away from home were up more than 2 percent. The marketing bill has increased every year since 1950 when it was the same as in the preceding year. From 1954 to 1964 it rose about 56 percent. During the same period, volume handled increased by 28 percent; and unit marketing charges went up 21 percent. Civilian consumers spent \$69 billion in 1964 for these food products, about \$3 billion more than in the year before. The marketing bill accounted for about two-thirds of civilian expenditures for farm foods in recent years.

Revised statistics on the retail cost, farm value, and farm-retail spread of a market basket of farm-originated food products will be published in November 1964. In making these revisions, use has been made of data collected in a recent survey of consumer expenditures, retail prices of additional food products, and new farm price series.

3. Central Food Preparation and Distribution in Urban School Systems. -- More than a million children are enrolled in urban schools where school lunches are not available. Many of these schools are old and in congested, low-income neighborhoods. Where installation of a school kitchen is not feasible, consideration has been given to problems and costs involved in central preparation and distribution of school lunches. Four forms of lunches meeting nutritional requirements of the National School Lunch Program were studied--the regular plate lunch, the tray-pack lunch (where the main dish is heated in special ovens at the receiving school); soup and sandwich lunch; and a packaged lunch. Attention was given to expanding output in existing school kitchens as well as installation of a new central kitchen--and to lunch service in classrooms as well as multipurpose rooms.

4. Cotton Ginning. -- Additional cleaning equipment in gins necessitated by increased mechanical harvesting, declining volumes in some areas, and rising costs of variable inputs have resulted in a sharp upward movement in average ginning costs and created an urgent need for reliable information designed to increase ginning efficiency. Our research indicates some definite possibilities for most ginneries. Substantial savings in power cost may be realized by peaking individual air systems used for materials handling; by rearranging gin machinery to eliminate unnecessary fans, motors, and piping; and properly loading electric motors. In addition, more efficient use of labor could reduce ginning costs between 13 and 33 cents per bale. Results also indicated that under present marketing conditions, most ginneries can profitably reclaim their gin notes.

5. Price Spreads for White Bread. -- Prices of many manufactured agricultural products, particularly bread, continue to rise. Research

indicates that the farm value of bread (wheat and other farm products) has largely remained unchanged for several years. But analysis of price spreads for white bread indicates that prices continued to rise into 1964 to 21.6 cents per 1-pound loaf, up nearly one-half cent from last year. As in previous years, much of the increase in retail prices is attributed to an increase in the baker-wholesaler gross spread and rise in retailing cost. Because of this, alternative methods of bread distribution are being evaluated.

6. Freezing Commercial Bakery Products: Practices, Problems, Prospects. --

Nearly 40 percent of the bakers were freezing part of their production and this practice seems likely to increase in the years ahead according to a study of current practices, problems, and prospects for freezing among bakers. This finding can be of considerable importance since freezing offers one practicable way of cutting costs of production and distribution of bakery goods in an industry plagued by rising costs. Another finding of importance is that most bakers not now using freezing were concerned about impairment of quality due to freezing and consequent poor acceptance by their customers. The excellent quality results by bakers presently using freezing and the favorable results of laboratory research by the Department suggests that some of these bakers were using improper techniques and are in need of information on the correct procedures for freezing and handling frozen bakery products. This report pinpoints where in the industry this problem exists and thus provides the industry with a sound basis for an informational program on freezing.

7. Promotional Expenditures by Producer Organizations. -- A survey of promotional expenditures of producer organizations and similar agriculturally oriented groups indicates that there are almost 1,200 of these organizations spending a total of about \$86 million annually for the promotion of agricultural products. This is an increase of nearly \$20 million over expenditures shown by these organizations in a similar survey in 1958. This increase in expenditures represents added self-help efforts by producer groups to build and strengthen markets for their products and to combat the problem of an imbalance between demand and supply. Fruit, which was the leading product promoted, and dairy, which ranked second, accounted for well over 50 percent of these expenditures. Meat and livestock products ranked third with expenditures of over \$6 million per year. Promotional expenditures for natural fibers, poultry and eggs, and field crops were comparable ranging between \$4 and \$5 million per year for each commodity class.

Voluntary producer-processor groups spent more than any of the other groups, with expenditures of nearly \$32 million per year. Cooperatives and commissions and boards operating under enabling legislation were also important, with each type of organization spending about \$25 million per year. State Departments of Agriculture and other organizations not identified spent less than the other types of organizations, with expenditures in each of these categories averaging about \$1.5 million per year.



8. Highway Transportation of Farm Products. -- Motortruck transportation of unmanufactured farm products continues to be an area where not enough is known about the quantities moved by these carriers and about the charges made by them for their services. The data gap exists because interstate hauling of these commodities is "exempt" from Government regulation insofar as rates charged and routes traveled are concerned. This year some research has been completed in this area and some has been initiated.

A study of the operating practices and nature of competition among truckers engaged primarily in hauling unmanufactured farm products for-hire was completed and the results were published. The findings analyzed methods used by these carriers to obtain business, competitive relationships, operating costs, and the practice of trip-leasing of equipment.

9. Economics of Marketing Horticultural Specialties. -- Research to analyze the economics of marketing floricultural products was initiated. It involves the development of basic economic information about the industry through: (1) special tabulations of census data to more clearly delineate changes in the horticultural specialty industries from 1949 to 1959, and (2) personal interview surveys to study the credit and financing problems of retail and wholesale florists. Census data indicate that the farm value of floral products increased 50 percent during the 1949-59 period, while the number of producing establishments declined slightly. A survey of 46 retail florists in four Iowa cities disclosed that 14 percent of their sales were wire sales. Of the 86 percent nonwire sales, 60 percent were made by telephone. It is indicated that perhaps 75 percent of all sales in the 46 stores were made to customers who did not see what they were buying and often did not see what they had bought.

The phase of the research underway to improve merchandising and promotional effectiveness for floral products includes: (1) a nationwide survey of approximately 4,000 retail florists to determine merchandising, advertising, pricing, procurement, credit, service, and other operating practices currently followed by retailers; (2) analysis of economic and demographic factors as they relate to the demand for flowers; (3) evaluation of specific promotional efforts by individuals or groups; and (4) a review and summary of published research relating to marketing floral products.



## AREA 1

### MARKET STRUCTURE AND COSTS

Problem: Market structure and costs research seeks new knowledge relating to three specific but related problem areas. One concerns the measurement of how much the marketing process costs and why it costs as much as it does. Another deals with how well the markets and institutions associated with it operate and how to improve those functions. The last identifies how fast adjustments are being made and develops ways to facilitate technological and other appropriate adjustments.

Because changes in the composition of the markets and practices of businesses directly affect the prices farmers receive for what they sell and the prices consumers pay for what they buy, research into the costs of marketing such products in fresh and processed form is necessary to hasten the appropriate adjustments to attain the lowest possible marketing cost with the minimum inconvenience to all, taking into account the financial needs and operating practices of producers, processors, distributors, and consumers.

### USDA AND COOPERATIVE PROGRAM

About one-half of the professional manpower assigned to these phases of marketing research is devoted to quantitative measurement of aggregate marketing costs and to determination of the resources required to produce marketing services. The other half is assigned to qualitative analysis of the performance of marketing organizations and institutions. Examples of the first activity are the "market basket" and the "marketing bill." Data for these are compiled regularly and are constantly reviewed for possible improvement. Examples of the second are studies of the pricing practices of retail food stores and of baked goods merchandisers.

Economic research in the area of resources and costs are usually of a cross-commodity nature. During the year a total of 8.3 man-years was used for this work; 6.3 were expended in measuring the resources utilized and the cost of those resources. Two persons sought ways to improve these measurements.

Studies of the market structure and institutional practices utilized 8.9 man-years. Of this total 4.3 man-years were used in the general areas of pricing practices of retail firms, labor practices, and Government regulation; 3.4 man-years were used to explore future employment opportunities and income prospects in food marketing for residents of low income farm areas; and 1.2 man-years to measure advertising and promotion activities by food marketing firms.

The findings of researchers in these areas--together with findings on other marketing and transportation problems--are reported in separate publications including technical journals and in the Department's quarterly publication entitled the Marketing and Transportation Situation. This quarterly publication is prepared and edited by the Market Structure and Costs Branch.

#### PROGRAM OF STATE EXPERIMENT STATIONS

Studies at State stations in the multiple commodity segment of market structure and costs are underway in all regions of the United States. The studies specifically on market structure cover a wide range of problem situations and tend to be grouped into three kinds of marketing research objectives. These include studies dealing with historical and descriptive aspects of market channels and structure, those directed at dynamic aspects of market forces and performance, and inquiries into impacts and needed changes in structure arising from agricultural programs and policies, vertical integration in business and rural economic development. Some of the more specific studies for each of these are given below.

Studies in the historical and descriptive aspects of structure include such problems as market discovery and development, specific geographic food industry organization and operation, multiple commodity market structure and performance, actual and potential performance for roadside market retail sales, relation of marketing to growth and development for food crop processing and distribution, and how market structure affects industry organization.

Studies are more numerous in the dynamic aspects of market structure. These include problems of organization and procurement policies and practices of large-scale food retailers, role of small retail food chains as markets for farm products, margins and competition in agricultural industries, relation between changes in the general economy and methods of operating for agricultural marketing firms, analysis of factors influencing decision-making processes in procurement of food by chain stores, and economic problems relating to quality maintenance in marketing channels.

Studies dealing with structure arising from impacts of policies, programs, integration, and economic development or needed to deal with these factors include projects directed at market control programs and alternative methods of controlling marketing, how adjustment programs affecting supply influence changes in marketing, evaluation of effect of market agreements and orders on the operation of the market, effects of integration on market structure and operations, adjustments in the agri-business sector in relation to the total economy, influence of geographic concentration of supply on market organization and operation, and structure of the market for services of recreation.

Studies in marketing costs in the multiple commodity segment probe into such problems as efficiency of procurement, processing, and distribution of farm



products, economies of scale in processing and marketing plants, improving efficiency in marketing firms and in the industry, labor utilization in food store merchandising, simplification of work methods and handling practices of selected marketing firms, and operating practices of successful independent retail grocery stores.

Total research effort on 31 projects at 20 stations is approximately 16 professional man-years of which about 2.6 man-years are on cost studies and 13.4 are on market structure.

## PROGRESS--USDA AND COOPERATIVE PROGRAMS

### Cross-Commodity

#### A. Structure, Practices, and Competition

1. Extent and Effects of Labor Practices and Provisions on the Costs, Adequacy, and Structure of Agricultural Marketing. Last year in this report fringe benefit payments were given for the periods 1954 and 1960 for food marketing (\$222.1 million in 1954 and \$474.7 million in 1960). Data for 1961 show that except for pension plans in Food and Kindred Products Manufacturing such benefits continued to rise. In spite of the year's drop from \$185.6 to \$173.0 million for Food and Kindred Products, pension plans' total benefits rose from \$474.7 to \$493.2 million. Wholesale and Retail Food Trades both experienced a significant rise in pension plans. Wholesale increased from \$17.7 to \$24.8 million and Retail from \$64.4 to \$71.5 million.

2. Patterns of Growth and Change in the Structure of Agricultural Marketing and Supply Industries and Their Probable Economic Consequences. The Markov chain process was adopted to determine the consequences of present firm growth tendencies if they continue to 1970-73. The number of fresh citrus interstate packers-shippers may decline to about 90 firms from the present of 153. Increasing shares will be handled by firms in larger size categories. Over time, any increase in trend in fresh volume above levels of the late 1950's and early 1960's probably will be handled through expansion of volume per firm rather than by any increase in the number of firms.

In another study the focus was upon the role of depreciation since World War II in the functioning of agricultural marketing firms. Since World War II, depreciation has increased more rapidly than total receipts, but profits after taxes have declined. The total of the two (depreciation and after-tax profits)--sometimes called total cash flows--declined in the late 1940's and reached a low in the early 1950's. Since then total cash flow has increased for agricultural industries.

When trends in depreciation, profits, and total cash flow are examined in relation to stockholders' equity rather than in relation to total receipts,



a different picture emerges. It is particularly noticeable if one looks at the entire 1939-59 period. Total receipts rose more than equity over those two decades. A combination of depreciation and profits for most agricultural industries trended upward relative to equity but remained steady to lower relative to total receipts.

3. Pricing Practices of Food Firms of Selected Products. Preliminary tabulations suggest several interesting relationships in prices for 260 items gathered twice-weekly for the fiscal year 1963 in 32 establishments located in two North Carolina communities. One is that the age composition of the family is a far more important factor for governing food expenditures than is the change in the number of prices for individual items. Even with no rise in the price of food or no more expensive foods in the market basket the food bill must grow along with the family. Using the moderate cost nutritionally balanced diet, a newly married couple would have spent \$18.73. Four years later with the same market basket and the same price structure assumed, with one child 3 years of age and one of 1 years of age, the couple would have spent \$26.43. Eleven years after marriage the same couple with a girl of 8 and a boy 10 years of age would spend \$32.11. The same couple 19 years after marriage with a girl of 16 and a boy of 18 would expend \$35.82. Twenty-one years after with a girl 18 and the boy no longer in the home the bill would drop to \$26.07. Twenty-three years after when the girl reaches 20 and leaves the home it would drop to \$17.83. Later on as the couple ages, if they follow medically approved diets, the costs would drop even further.

4. The Effect of Federal Regulatory Activities on Agricultural Marketing and Processing Industries. Significant questions currently being raised concern the possible effects of structural changes in the grain industry and of the role of Government grain price support programs on operations of the grain futures markets. For example, it has been suggested that vertical integration, by eliminating market exchange processes, reduces the number of firms that may need the barest of grain price changes. However, it has been hypothesized that there is less price risk in carrying inventory in vertically integrated firms that sell at retail level, because retail prices do not fluctuate as widely nor as unpredictably as commodity and wholesale prices. In contrast it has also been observed that many vertically integrated firms continue to make extensive use of grain futures markets.

Research has been initiated to determine the effects of changes in the organizational structure of soybean related firms under use of the futures market, to determine relations between variations in firm organization and the use of the futures market, to determine changes in the structure of the futures market, and compare these changes in the present structure of three commodity markets--soybean, soybean oil, and soybean meal. (Structure as used here refers to the concentration of open contracts in a particular future on a given market day. The primary measurement is the percent of open contracts held by the four and eight largest traders.)

## B. Information, Outlook, and Rural Development

1. Role of Agricultural Marketing and Other Firms in Supplying Additional Employment and Higher Incomes for Residents of Low-Income Farm Areas. Farm employment has been declining while output of raw food and fibers has been increasing. Some of the reduction in manpower on farms has been caused by the substitution of industrially produced inputs for farm labor.

Work has been initiated to ascertain the amount of net new investment made by manufacturing and marketing firms in specified counties for the period 1953-63. Investment, employment, and similar data will be used to determine total economic growth and its composition. Supplemental data including numbers and kinds of jobs associated with specific kinds of investment will be used to identify specific patterns of growth.

2. Marketing Situation and Outlook Reports. Marketing charges for food products have been stable thus far in 1964. Unit costs of marketing firms, likewise, probably have been stable. Prices of most goods and services in recent years have changed little. Improvements in productivity have held unit labor costs down in food marketing. They increased less than 1 percent from 1962 to 1963, although average hourly earnings rose 3 percent.

Consumer expenditures for foods in the first quarter of 1964 averaged \$410 per capita compared with \$402 in the previous quarter and \$401 in the first quarter last year. The expenditures in the first quarter this year represented 18.7 percent of disposable personal income compared with 19.1 percent in the first quarter of 1963. The percentage of disposable income spent for food declined to 18.9 percent in 1963 from 22.4 percent 10 years earlier.

The Marketing and Transportation Situation, a quarterly publication of the Economic Research Service, regularly includes statistics on retail prices, farm values, and farm-retail spreads for foods, cotton products, and cigarettes. It also includes statistics on the marketing bill, consumer expenditures, and returns to farmers for products of domestic farm origin, on marketing firms' costs and profits, and on related subjects.

3. Appraisal of Uses Made of and Needs for Marketing Information. Farmers and businessmen can make accurate production and marketing decisions only if they possess relevant facts. Because needs for information constantly change, the Department continually sponsors studies directly toward showing how this information service can better meet user requirements. During the past year a study was completed showing whether farmers and tradesmen of the feedgrains and livestock industries of the Southwest (1) use market information disseminated by public and private sources, (2) evaluate these sources, and (3) would change the content to better meet their needs.

In terms of total information output the Department received a strong vote of confidence from both groups of producers. Nine out of 10 producers who

expressed an opinion wished USDA to continue its present program without major alterations. Ninety-five percent of the producers expressing their opinions objected to the proposition, "The USDA should discontinue all reports on production and marketing." While both sets of producers desire USDA to continue in the same manner, there is a statistically significant difference between the feedgrains and livestock producers in their attitude. Of the total possible feedgrains respondents 84 percent wished the Department to continue, 7 percent wished discontinuance, and 9 percent had no expression of opinion. Of the total possible livestock respondents 72 percent wished it to continue, 21 percent wished discontinuance, and 7 percent had no opinion.

4. Providing Statistical and Economic Information Relating to the Marketing of Agricultural Products. Requests from business firms and trade associations have been more numerous during the year just ended than in most earlier ones. Considerable time has been required to assemble information needed to answer these requests.

5. Long-Term Outlook for Marketing Western Agricultural Products. Outlook for marketing of farm food products in the 11 Western States was projected for the period 1985. Projected increases in population and income will result in increased quantity of foods marketed within the region. The western region has an advantage in the production of fresh and processed fruits, vegetables, nuts, and beet sugar yielding substantial net surpluses for sale outside the region. The total combined surplus of net production over consumption of these commodities (in retail equivalent weights) is expected to increase about two-thirds from 1960-61 to 1985. The principal net production deficits for the region are in meats, poultry, dairy, and flour products. The combined total net deficit of these commodities is expected to double over the same period. For the other commodity groups, net production and consumption are expected to remain in balance.

Based on estimates of the rate of growth in labor productivity in the West during the post-war years, employment is projected to increase in only two major food manufacturing groups, processing fruits and vegetables and bakery products. Substantial increases are projected also in wholesaling and retailing farm food products. Output and employment in food distribution in the 11 Western States are expected to show relatively greater increases than output and employment in food processing.

6. Long-Term Outlook for Industries Assembling and Processing Agricultural Products in the Pacific Northwest. This study projects production and employment in establishments assembling and manufacturing farm food products by 5 year periods between 1965 and 1980. The geographical area covered includes the States of Washington, Oregon, Idaho, and western Montana. The projected employment was distributed by power supply areas within this geographical region. These projected employment figures were made for the Bonneville Power Authority and will be used by them in projecting electricity requirements in the Pacific Northwest. This project will be completed in early fiscal year 1965.



### C. Margin, Cost, and Efficiency

1. The Development, Maintenance, and Analysis of Farm-to-Retail Price Spreads, the Marketing Bill, and Other Statistics on Entire Marketing Process. The retail costs, farm values, and farm-retail spreads of the farm-food market basket were about the same in the first half of 1964 as in the corresponding period last year. The farmer's share of the dollar consumers spent for farm foods in retail stores was also the same as in the corresponding period last year (36 cents).

The marketing bill for domestic farm food bought by U.S. civilian consumers totaled \$45 billion in 1963, 5 percent more than in 1962. This increase was somewhat larger than the average annual increase in recent years. Total payments to farmers for the farm products decreased slightly to \$21.4 billion in 1963. This decrease, the first since 1959, resulted from lower farm prices. Consumer expenditures for these products rose to \$66.4 billion in 1963, \$2 billion more than in the previous year.

U.S. civilian consumers spent \$37.1 billion in 1963 for nonfood products of domestic farm origin--apparel and other finished textiles, shoes and other leather goods, tobacco, and alcoholic beverages. The bill for marketing these products amounted to \$28.5 billion, excise taxes were \$6.2 billion, and farmers received \$2.4 billion from these products.

Market basket statistics are being revised and will be published in November of 1964. The revision will be based on consumer expenditure data collected in 1960-61 and retail price data collected for the new Consumer Price Index being prepared by Bureau of Labor Statistics. Every phase of market basket statistics is being examined, and additional data are being employed to improve the adequacy of the market basket series. Revised data will be published this year for 1957-64. Data for earlier years will be published at a later date.

2. Measurement of Aggregate Economic Relations in Marketing Farm Food Products. Charges for marketing farm originated foods per unit of products marketed were 44 percent higher in 1963 than in 1947-49. However, this rise was not as large as increases in average hourly earnings, in prices of plant and equipment, and in prices of intermediate goods and services purchased by food marketing firms. Gains in labor productivity kept unit marketing charges from rising as much as hourly earnings and price of other inputs. Labor costs per unit of product marketed were about 50 percent greater in 1963 than in 1947, although average hourly earnings (including fringe benefits) were more than twice as high in 1963.

Output of marketing services per man-hour--the most comprehensive measure of production available in marketing domestic farm food products--increased at an average annual rate of 2.6 percent from 1947 to 1963. This rate was about the same as the rate in the private nonfarm sector of the economy as a whole but only about half as large as in farming. Output of marketing

services increased at about the same rate as output per man-hour so that man-hours worked changed little from 1947 to 1963.

Output per man-hour in food manufacturing rose about 3 percent per year from 1947 to 1963. The effect on food marketing costs of this more rapid rate of growth was partly offset by a slower growth rate in the food distribution sector of the marketing system.

## PUBLICATIONS--USDA AND COOPERATIVE PROGRAMS

### Cross-Commodity

- Hiemstra, S. J. December 1963. Rising Depreciation of Assets in Agricultural Marketing Firms: Some Causes and Implications, AER No. 47. 51 pp.
- Walsh, R. G. and Evans, B. M. December 1963. Economics of Change in Market Structure, Conduct and Performance, the Baking Industry, 1947-58, University of Nebraska New Series No. 28. 167 pp.
- Bird, K. M. January 1964. Freeze-Drying of Foods: Cost Projections, MRR No. 639. 34 pp.
- Bird, K. M. January 1964. Selected Writings on Freeze-Drying of Foods, ERS No. 147. 53 pp.
- Wesson, W. T. February 1964. Taxes Paid by Firms Marketing Farm Food Products, AER No. 50. 52 pp.
- Freund, R. A. August 1964. Employment in the Final Manufacture of Supplies and Equipment Used by Farmers, 1950 and 1960, ERS-193. 4 pp.
- Lifquist, R. C. August 1964. "The ABC's of Buying," The Farm Index. 5 pp.
- Blaich, O. P. et al. 1964. The Grain Livestock Economy of the European Economic Community: A Compendium of Basic Statistics, ERS Task Force Report. 55 pp.
- Nelson, P. E. 1964. "Operational Criteria for Evaluating Market Performance of Firms and Industries in Food Marketing and Processing," Market Structure Research, Theory and Practice in Agricultural Economics, Iowa State University Press. 5 pp.
- Paul, A. B. 1964. "Examining Selected Features of Commodity Markets Through Balance Sheets," Proceedings of the Western Farm Economics Association, San Luis Obispo, California. 29 pp.
- Marketing and Transportation Situation. November 1963, 46 pp.; February 1964, 43 pp.; May 1964, 39 pp.; and August 1964, 40 pp.



## AREA 2

### MARKET POTENTIALS FOR NEW PRODUCTS AND USES

Problem: Increased emphasis should be placed on new products and new uses because of their importance in expanding markets and maintaining a high rate of economic growth. Agricultural producers and processors need to take maximum advantage of the opportunities offered with respect to additional outlets for surplus supplies, increased returns, lowered costs, and improved competitive positions relative to non-agricultural products. Continuing evaluations are needed of the commercial feasibility and market potentials of new or improved agricultural products, by-products, and products from new crops in food, feed, and industrial uses; of the economic feasibility of developing new uses and establishing new crops, including appraisal of their impact on present markets; and of the economic and technical requirements of end-uses. Such evaluation will provide a sound economic base for decisions on commercial developments, as well as information to guide further utilization research by physical scientists.

### USDA AND COOPERATIVE PROGRAM

The Department has a continuing long-term program involving agricultural economists and personnel with dual economic and technical training engaged in research to bridge the gap between laboratory developments and commercial adoption to assist producers to realize more rapidly and more fully benefits of lowered costs, increased returns, and expanded markets that new products and new uses can afford. Research is carried on in industrial and food uses at Washington, D.C., and six field offices -- agricultural economists are located at each of the four Utilization Research and Development Divisions, New Orleans, Louisiana; Albany, California; Philadelphia, Pennsylvania; and Peoria, Illinois. Economists are also stationed at the Hawaii Agricultural Experiment Station, Honolulu, Hawaii, and at the Department of Agricultural Economics, Clemson University, Clemson, South Carolina.

Research is conducted on animal products, cotton, grain and forages, oilseeds, horticultural crops, new crops, and on impacts of technological innovations. Cooperative research is conducted with the Hawaii Agricultural Experiment Station on Kona coffee and Hawaiian fruits and vegetables, with the Pennsylvania Agricultural Experiment Station on maple products, with the Louisiana Agricultural Experiment Station on a new sweetpotato product, and with Clemson University on market potentials for modified milk. Producer groups, such as the Louisiana Sweetpotato Commission and the Michigan Apple Commission, contribute to studies of potentials of new products pertaining to their area of interest.

The Federal scientific effort devoted to research in this area totals about 19.9 man-years. Commodity-wise, 4.7 man-years are currently devoted to animal products; 3.1 to grains; 2.6 to oilseeds and sugar; 3.9 to horticultural crops; and 5.6 to other research, principally new crops and impact of technological innovations.

#### PROGRAM OF STATE EXPERIMENT STATIONS

Little, if any, research in economics is carried out in this area by State agricultural experiment station personnel. Much research is being conducted on the development of improved products and uses, but it is in the area of technology.

#### PROGRESS -- USDA AND COOPERATIVE PROGRAM

##### A. Dairy

1. Market Potentials for Low-Fat Milk. Research to measure the market position of low-fat (two-percent) milk and to evaluate its impact on consumption has been completed. Sales of low-fat milk appear to be beneficial to the dairy industry. Although the product displaces whole and skim (other than low-fat) fluid milks to some extent, it has brought new users of fluid milk into the market place. Total fluid milk sales do not appear to be increased by the product's sale. However, its pattern of use indicates that declines have been partially offset in whole milk volume that otherwise might have taken place. Return from milk sales to those consumers who are established users of low-fat milk are greater than they would be if the product were not available.

2. Market Potential for Modified Milk in the Southeast. As a part of research to determine the product mix that will maximize milk consumption, work has been initiated in cooperation with Clemson University to evaluate market possibilities for and impacts of a modified milk. Research to date has dealt with ascertaining the optimum product composition in terms of butter-fat, non-fat, and total solids levels to be used in full scale market testing. After this phase is completed, it is anticipated the product selected will be subjected to vigorous market testing to determine acceptance, sales rates, and impacts on other milk product sales and total sales to provide guides for decisions for the industry.

3. Institutional Market Potentials for Sterile Concentrate. Plans are being developed to undertake, in cooperation with the Wisconsin Agricultural Experiment Station, a research program to evaluate sterilized milk concentrate in institutional markets. The work will be designed to determine the place of such a product among the products the dairy industry offers for sale; i.e., the particular markets and uses where it might be advantageous to sell a sterile concentrate as well as its potentials and impacts.

## B. Beef

1. Market Possibilities for Hides and Leather. The growing threat to hides and leather use by synthetic products has led to an intensified research effort to find ways to improve the competitive position of the hides and leather industry. One avenue of investigation in cooperation with the industry is an appraisal of the economics of a modified hide trim. A field test has been made on 120 hides to determine the feasibility of cutting hides into segments and processing only the highest value portion of a hide. Preliminary analysis indicates there is a significant improvement in tannery efficiency and the grade of finished leather when bellies and trim are removed from a hide prior to tanning. Corollary investigations are also going forward to ascertain if uses of economic value may be made of the parts of the hide that are not used for leather.

## C. Sheep and Wool

1. The Market for Wurlan Wool. Wurlanized wool developed by WU closely meets requirements for complete launderability needs, as determined in a market study, to enable all-wool apparel to compete more effectively with easy-care fabrics. The study of market prospects for easy-care, all-wool apparel showed that practically all retailers sold easy-care wool blends, whereas only 50 percent of the retailers carried at least one all-wool apparel item with some limited launderability features. Market reactions indicated that the addition of the complete launderability feature to wool's existing functional serviceability and aesthetic features would find broad acceptance and may offer a means to increase market value and sales of many all-wool apparel items. About 131 million pounds of wool presently go into apparel items in which the complete launderability feature could be applied to advantage. From a cost aspect, consumers would soon more than recoup higher initial purchase costs of completely launderable all-wool garments through reduced maintenance costs.

## D. Poultry

1. Egg Processing Costs. Data have been collected and analysis begun on comparative costs of preparing and marketing egg products by freezing and drying. Costs, together with other information on the various properties of eggs processed in various forms, will provide a basis for most efficient use of egg products in particular uses.

## E. Livestock (Cross Commodity)

1. Potentials of Soaps, Detergents, and Surfactants from Fats and Oils. Research on the economic potential of soaps, detergents, and surfactants made from fats and oils has been completed. Detergent makers expect to be able to use petroleum raw materials at little increase in cost in the manufacture of soft detergents to combat pollution problems. If the new



soft detergents are technically competent in cleansing power and degradability, prospects are not bright for increasing volume or prices for fat materials in this use unless laboratory research develops new fat materials that will surpass competing materials in cleansing power or other functions. An item of significance at least in foreign markets is that the government committee on water pollution by detergents in Great Britain has come out in favor of a detergent composition with a 50/50 mixture of a petroleum base and a natural fat base.

2. Fats in Feeds. Brief reviews are made from time to time to check conditions and progress in markets previously researched but which are of continuing importance. A change in the source of data collected by Census on consumption of fats in feeds reveals that this market for fats is much larger than had been reported. Revised figures upped consumption of inedible tallow and grease in feeds by 76 percent in the first quarter of 1964 and indicate the use of 800 million pounds this year. A study of market potentials for fats in feeds, reported in MRR 498 (Sept. 1961), projected that fat use would reach to an annual rate of 1.4 billion pounds by 1970. Reported use in subsequent years did not show an increase over the 1961 rate even though all research evidence indicated otherwise. By collecting data from renderers instead of feed manufacturers, Census is now obtaining a more accurate coverage of tallow and grease disposition. Other fats still not reported, such as poultry oil and hydrolyzed foats, would swell total use by almost another 100 million pounds a year. The feed market now outranks the soap market as an outlet for fats and oils in both price and volume.

#### F. Grains

1. Rice Distribution Patterns. The rice industry has achieved a higher level of rice sales on a per-capita basis in the domestic market. Studies carried out in cooperation with the industry to provide basic market data for marketing decisions show that per-capita distribution of rice increased from 5.8 pounds in 1956-57 to 7.0 pounds in the 1961-62 marketing year. In other terms, market use increased by 26 percent. The major factors apparently at work influencing this change was the stepped-up marketing activities of the industry. A significant observation is that rice sales, relatively unresponsive to price changes, have responded to other market stimuli.

2. Farm Products in Adhesives. Qualitative market evaluations have shown that synthetic adhesives are taking more and more binding jobs away from the traditional adhesives derived from farm products. This trend is likely to continue for those uses demanding high-cost exotic properties; however, large markets will continue to exist for low-cost agricultural materials because they are economical and technically adequate for many applications. Efforts have been made to assess more specifically in quantitative terms the size of market outlets and potentials for particular agricultural materials used as adhesives. Existing information has proved inadequate

for this purpose and more intensive market evaluations will be necessary to provide accurate data that many firms have requested for certain products in specific uses.

3. New Uses for Starch. The report of the contractor on the most promising new possibilities for starch, as a means of expanding industrial markets for starch is being reviewed for guides to direct further research efforts into fruitful channels. Cationic starches cited as a promising prospect are now being used in increasing quantities, in paper manufacturing at premium prices. In addition, as previously reported, the work indicates that other potential starch raw material developments merit careful scrutiny, such as high specific gravity solvents, vapor sorbers, and carbonated or frozen starches, for uses in three major processing industries -- petroleum, mining, portland cement and gypsum wallboard.

4. Markets for Water-Soluble Gums. Market opportunities for gums produced by microbial conversion of starch slurries were assessed. Preliminary conclusions indicate such new materials have significant potential in the current market for some 80 million pounds of materials worth about \$42 million. However, additional development work is needed to improve the economics of their production before these levels can be achieved in competition with imported natural gums and starches, and domestic starch and synthetics. The gums are used with starch in a limited number of applications.

5. Freezing Bakery Products. The survey of the present and probable role of freezing as the first step in appraising the feasibility of adopting freezing techniques to achieve economies in the production and distribution of bakery products has been completed. Freezing is being adopted by more and more bakers because the preponderance of experience indicates cost savings are possible and that fresher quality products are made more available at all times. Preliminary investigations are underway to determine factors accounting for price differences for bread between markets and whether freezing can help to reduce costs in markets where retail prices are highest. In addition, exploratory research has been initiated to study the penetration and impact on demand and costs of specific innovations, such as frozen dough.

6. Industrial Flour Products from Air Classification. An analysis has been made of air classification of wheat as a means of producing industrial flour fractions. Because air classification permits concentration of the protein and starch components in separate fractions at low cost, the technique has been proposed as a means of producing economical high starch-low protein wheat flour products for industrial use. Prospective returns from a range of production output possibilities from applying the air classification technique to both hard and soft wheats were compared. Those output possibilities, which included the industrial fractions, were least profitable to the miller.



However, it may be advantageous for a miller to produce the industrial fraction under certain conditions. For example, if demand for his cake and other low-protein flours had been saturated but additional demand existed for the high-protein fraction, the production of the industrial fraction would be profitable as long as revenue from the added output was above the miller's marginal costs.

### G. Oilseeds and Peanuts

1. Economics of Whole Soybeans for Feed. Continuing evaluations of the economics of using whole soybeans for feed indicate that soybeans converted by heat treatment at local facilities in soybean-producing areas may be the way to obtain cooked full-fat soybeans for livestock feeds at low cost. Many soybean-growing areas also are important livestock and poultry feeding areas. Soybean oil normally sells at a higher price than feed-grade tallow, because it is an edible fat and feed-grade tallow is not. Price differences of 4 cents a pound or greater between soybean oil and feed-grade tallow can be offset by the nutritional, transportation, handling and processing cost savings offered when soybeans are used this new way. During the 1962-63 crop year, the average price spread between these fats was 3.4 cents per pound. The advantages favoring making a ton of cooked soybeans in various locations in 1962-63 over an equivalent feed made up of 44 percent soybean meal, plus prime tallow were as follows: Arkansas, \$8.46; Delmarva, \$20.46; Georgia, \$15.69; and Ohio, \$21.24. The cost advantages in these localities will be even greater for the 1963-64 crop year.

2. Farm Products in Polyurethanes. Studies of the use of farm products in polyurethanes indicate that starch and sugar derivatives are used in largest quantities in current market applications. Fats and oils derivatives are not being used currently in the quantities that earlier trends promised. Laboratory research has been directed to developing improved castor-based foams at lower costs. This research could have an impact on future market applications, but further study will be required to ascertain adequately what the impact may be.

3. Markets for Safflower Products. Research has been initiated and is in preliminary phases on safflower oil to ascertain the share of the edible oils market that it is likely to gain and maintain, competitive relations with other materials, its industrial use possibilities, and the potentials for safflower meal for livestock feeding in the west. This research should be helpful in appraising where this crop will eventually fit in the over-all oilseed production and use pattern.

4. Potentials for Modified Edible Oils. Work was completed on four present and potential edible fats and oils markets to identify applications in which research and development can most effectively contribute to increased use. Product improvements could increase use of domestic modified edible fats and oils by 82 million pounds above normal growth over the next 5 years. Improvements in melting characteristics, gloss, and mold release could bring

a 40-million pound growth in confectionery coatings. Improvements in abrasion resistance and transparency and cost reductions could lead to a 35-million pound gain in protective edible coatings. Edible food lubricants usage could be upped by 7 million pounds if tendencies toward rancidity and polymerization were reduced. Little gain can be expected in use of food emulsifiers.

## H. Sugar

1. Markets for Maple Products. Research is continuing under a cooperative agreement with Pennsylvania State University on maple products. Particular attention is being given to delineating outlets for syrup, relative returns to growers from the various outlets and the economics of establishing central evaporating plants. A report is being prepared by the cooperator, and it is expected that the results of the study will be helpful in evaluating rural area development proposals on maple.

## I. Fruits and Vegetables

1. Market Potentials for Kona Coffee. Research continues in cooperation with the Hawaiian Experiment Station to help improve returns from Kona coffee, the producers of which face severe price problems stemming from the world coffee situation. Results of a limited market test of a new instant Kona coffee in Honolulu indicate the product met with high acceptance as a quality product. Thus, it is saleable in competition with other coffees. The key questions from a returns standpoint are can a consistently high-quality distinctive coffee be supplied on a continuing basis, and what premium can be maintained over other coffees?

2. Market Testing Sweetpotato Flakes. An institutional market test on sweetpotato flakes, a new convenient-to-use product developed by SU, has been completed. Research results indicated a highly favorable reaction to this new product by management, kitchen help and customers of restaurants, and other types of institutional outlets. However, to build a large market for a new product, sales to household consumers must be promoted in the retail market. Introduction into the household market was delayed because of technical problems in packaging sweetpotato flakes. Therefore, it was considered desirable to conduct a small scale market test of sweetpotato flakes in three types of packages -- tin cans, glass jars, and flexible pouches in paper boxes. The objective was to determine the type of package which offers the best potential based on customer purchases. In all phases of this research, consumers rated glass jars higher than the paper box and the tin can. This may partly be caused by the attractive visual appearance of the product in the jar. The results clearly indicate that no package disadvantage would attend the retail sale of sweetpotato flakes packed in glass.

3. Market Acceptance of Explosion Puff Dehydrated Products. Exploratory research has been initiated on the application of the explosive puff dehydration process on blueberries, a development of EU, for pie baking. These berries rehydrate much more quickly than conventionally dried materials. Preliminary testing of the dehydrated blueberries in pie baking operations showed the flavor of the product was satisfactory. Problems revealed in use of the berries in testing such as level and type of starch used can easily be overcome.

Further research is planned to obtain additional information on institutional market outlets which appear promising in terms of volume and types of products now used and the influence of the explosion puff dehydrated product on the overall costs and efficiency of institutional operations. It is anticipated that the experience gained in the work on blueberries will be applied to other explosive puffed products, such as apple slices and potato pieces.

#### J. Cross Commodity

1. Factors Affecting Demand for New Products. Data collected in connection with previous studies of convenience foods are being analyzed to measure the effect of various demand factors on sales volume of 106 convenience foods. Research in this area will provide basic information of importance in evaluating prospective acceptance of new products. Preliminary findings show a highly significant statistical relationship between sales volume and several variables. Variables found to be associated with sales volume of convenience foods were: (1) Cost per serving of convenience foods, (2) cost per serving of the fresh or home-prepared, (3) size of product group in which the convenience product fell, and (4) percent availability of the convenience form.

2. Economics of New Crops. Economists evaluate the variables affecting probable market success of new crops to provide guides for the Department's new crop development program. The market for *Crambe abyssinica* whole oil has been investigated. Technically, Crambe oil can be used in many products. Economically, many of these uses are unattainable because of the low prices of materials it would have to replace, such as rapeseed, which is a strong competitor in markets in which whole Crambe oil could be used. However, small scale commercial production of Crambe is feasible in selected geographical areas in the U.S. and would find a ready market in some rubber products (factice). Markets for fatty acids from Crambe oil, primarily its erucic acid, are presently limited because of low prices of substitute materials and lack of research data on the performance characteristics of products utilizing pelargonic and brassylic acid as raw material ingredients. Plasticizers made from brassylic acid may have limited usage in specialty plastic products made with polyvinyl chloride. Prices of competing plasticizers limit the market for plasticizers made from Crambe oil derivatives. Crambe wax has limited use in carbon paper because of low prices (less than 30 cents per pound) of alternate waxes and present



carbon paper production practices. Data on the use and physical characteristics of commercial waxes is in preparation for use of the Department's utilization laboratories.

Data is being collected on kenaf, a potential fiber and pulp crop. The literature has been searched and a bibliography has been published.

3. Potentials for Freeze-Drying. A new marketing technology of interest to food processors, food handlers, producers, and consumers is freeze-drying. An economic evaluation of the industry shows that over 50 products are now on the market with most of them going to secondary processing and institutions. Retail markets appear limited. At present, 12 firms in the United States and about 20 companies abroad process freeze-dried foods. A projection of freeze-drying shows that in the future, with economies of size that are probable for the industry, costs may be as low as 5 cents per pound of water removed. This compares with spray and roller drying costs of less than 1 cent. A projection of volumes shows that we may expect 42 plants to be in operation by 1970, and by that time volumes would have increased from the present 11 million pounds in 1963 to 250 million.

#### K. Liaison Between ERS and Utilization Research, ARS

An agricultural economist is stationed at each regional Utilization Research and Development Division to provide liaison between the regional laboratories, ARS, and the Economic Research Service in order that economic research may be teamed with physical science research in approaching problems relating to new products and new uses. Phases of work are as follows:

- (1) To delineate the economic problems involved in developing markets for new and extended uses of commodities on which the laboratories are working;
- (2) to develop and assist in carrying out research studies for providing information that would aid the laboratories in deciding what particular products or processes would be most likely to be economically feasible; and
- (3) to develop and assist in carrying out research studies for appraising new products and processes developed by the laboratories, including studies of market potentials, comparative costs, and studies of the probable impact of new developments on sales and farm income.

PUBLICATIONS -- USDA AND COOPERATIVE PROGRAMS

Beef

Thompson, John W. January 1964. Hide and Leather Situation, 1964.  
ERS-161. 4 pp.

Thompson, John W. July 1964. Recent Changes in Hide Marketings.  
Livestock and Meat Situation. 2 pp.

Thompson, John W. May 1964. A Guide to Lower Costs and Greater  
Efficiency in Curing Cattle Hides. AE Report No. 54. 20 pp.

Livestock (Cross Commodity)

Speel, H. C., and Poats, F. J. April 1964. Economic Potential of Soaps,  
Detergents, and Surfactants Made from Fats and Oils. AE Report No. 53.  
18 pp.

Grains

McGrath, E. J. May 1964. Distribution Patterns for Rice in the United  
States. ERS-126. 27 pp.

Trotter, W. K., and Miller, D. L. June 1964. Economics of Air Classi-  
fying Typical Wheat Flours. American Miller and Processor. 4 pp

Schiest, Irving. 1964. Adhesives. Interscience Encyclopedia of Polymers  
Volume I. 18 pp.

Rollag, Norman, and Enochian, R. V. September 1964. Freezing of Commer-  
cial Bakery Products: Current Practices, Problems and Prospects. MRR-674.  
46 pp.

Oilseeds and Peanuts

Hester, O. C., and Boggs, R. L. May 1964. Market Potential for Modified  
Edible Fats and Oils. MRR-659. 30 pp.

Fruits and Vegetables

Linstrom, H. R., Keeler, J. T., and Creek, C. R. January 1964. A Pilot  
Market Test of Instant Kona Coffee. AE-65. Hawaii Agricultural Experi-  
ment Station. 11 pp.

Kerr, H. W., and Hester, O. C. August 1964. Recent Research on the Mar-  
keting of Sweetpotato Flakes. ERS-194. 5 pp.

Cross-Commodity

Corkern, Ray S. January 1964. Kenaf, A Bibliography, 1950-62. ERS-153. 16 pp.



### AREA 3 MERCHANDISING AND PROMOTION PRACTICES

Problem: Problems of selling efficiency, consumer acceptance, orderly distribution, and coordination have grown in scope and complexity as major changes have occurred in the production, processing, and distribution of farm products. Because of the wide array of products made available to consumers, through self-service retailing, as well as other factors, merchandising, promotion, the control of product distribution and movement, and management decision-making have increased in importance as basic and essential functions in the marketing of farm products.

Because of self-service not only must a product offered in today's supermarket be its own salesman but also it must compete directly or indirectly with thousands of other items for consumers expenditures. Substantial sums are being spent by farm groups, food processors, and retailers in merchandising and promotional efforts.

Information is needed by producer groups as well as distributors at other levels in the marketing channels to determine the effectiveness of alternative promotion, merchandising and advertising techniques, levels of promotional intensity necessary for maximum sales response and the characteristics of products lending themselves to promotional stimuli. There is a basic need for development of principles or guidelines broadly applicable to agricultural commodities and which may be used in developing and strengthening commodity promotion. More effective merchandising of farm products is also required if demand is to be influenced and greater consumer acceptance gained for farm products. Sales of individual products have become increasingly dependent on in-store merchandising that will attract consumers and influence purchases. This is particularly true for many farm commodities which are not pre-sold through intensive advertising.

Because of increased complexity of operation, firms processing and distributing farm products need information which will assist in improving management efficiency. Smaller firms and particularly those operated by producers often do not have the resources or experience necessary to develop the information or techniques necessary for more efficient operations.

### USDA AND COOPERATIVE PROGRAMS

The Department has a continuing long-term program of research in merchandising, management analysis, product distribution, and promotion evaluation to provide information which can be used by producers, handlers and distributors in strengthening and expanding markets for farm products. The merchandising research program is designed to quantitatively evaluate the impact of selected selling practices and price policies on the demand for agricultural products. Specific studies have as their objectives the development

of income-expenditure elasticities and measurement of other factors influencing demand, determination of consumer and market profiles, and evaluation of alternative merchandising techniques such as packaging, display, pricing, featuring and product variation on consumer purchases.

Research relating to promotion and advertising includes studies to: determine organizational structure and procedures of commodity promotion groups for optimum control, coordination and conduct of their program; measure levels of advertising and promotional intensity required to influence sales, evaluate relative effectiveness of alternative promotional appeals, themes, and techniques, and develop principles applicable to the promotion of farm products.

Studies of product distribution, such as availability, movement of products into consumption, and profiles of markets and consumers, provide information by which sound advertising, merchandising and management decisions can be made. In addition, management type studies are conducted to provide techniques and procedures which can be used to coordinate the diverse marketing functions and improve efficiency of firms distributing farm products. Most merchandising and promotion studies are conducted in close cooperation with producer or industry groups, food wholesalers, and retailers. Industry groups giving direct financial support to research during the year include, the American Dairy Association, the Florida Citrus Commission, and Florists' Telegraph Delivery Association.

During fiscal 1964, approximately 14.5 professional man-years were directed to the area of merchandising and promotion. Of this total, 2.0 were devoted to dairy; .3 to beef; .3 to poultry; 1.1 to grains and forage; 3.5 to citrus and subtropical fruits; 1.1 to deciduous fruits and tree nuts; 2.0 to flowers, ornamentals and shade trees; and 5.2 to cross-commodities.

The research effort is centered in Washington, D. C., with professional employees stationed at State Experiment Stations in Washington and Indiana. Cooperative studies are being conducted with the following State Experiment Stations: Arizona, Indiana, Ohio, and Washington. Many studies involve data collection on a national basis while others involve case studies, and controlled experiments in selected locations.

#### PROGRAM OF STATE EXPERIMENT STATIONS

Much of the research at the State agricultural experiment stations in the area of merchandising and promotion is carried out in connection with specific commodities and thus reported under those headings. That reported here is problem-oriented and only incidentally commodity-oriented. Thus, to get the total effort in this area one would need to add that reported under the specific commodity sections of this report.

Consumer acceptance, preference and attitude studies represent an on-going phase of the State program. Current work deals with food and fiber items



as well as nursery products. This research is undertaken for the purpose of market test and development and, thus, is closely allied with the product development phases of the Stations program. In the year reported, this research totaled 11.4 professional man-years.

Research on consumer motivation and decision-making is underway at 15 State stations. These studies are concerned with type and amount of influence resulting from food promotion and consumer information programs, with factors affecting food purchase decisions, and with consumer behavior in the market place. Limited work is also underway on improved consumer grades for agricultural products. This phase of the market development research totals 17.7 professional man-years.

Research Example--Children's Role in Influencing Food Purchases, Miss. Project 1238.

While children's influence upon family food practices is readily accepted, there is little knowledge about the nature and extent of their role. The Mississippi Agricultural Experiment Station reports that nine- and ten-year-olds are like their elders in that they know somewhat more about food needs than they put into practice. The usual reason for not eating needed foods was that they were not provided by the family. The children studied learned about food from many sources, especially those involving social activity. Market promotion schemes (labels, coupons, and premiums) seemed to have little effect upon them. They reported that requests of parents to buy a food were usually granted, and that all types of food were requested--meat, vegetables, sweets, and soft drinks. This study concluded that the role of the mother in influencing children's food patterns should not be underestimated.

## PROGRESS -- USDA AND COOPERATIVE PROGRAMS

### A. Dairy

#### (1) Effect of Different Levels of Promotion Outlay on Sales of Fluid Milk.

A study was initiated in March 1963 in cooperation with the American Dairy Association to measure the impact of different levels of promotion on sales of fluid milk. Levels of promotional expenditures being tested included 15 and 30 cents per capita above present levels of expenditure on an annual basis. Present levels of expenditures are being used as the control or base. The alternative levels of promotional expenditures are being tested in six major market areas over a 2-year period which will end in February 1965. In addition to sales data, information on levels of employment, school enrollments, and merchandising practices employed in sample retail food stores will be used in evaluating sales of the different levels of promotional expenditure.

## B. Beef

(1) Economics of Pricing, Merchandising, and Labor Utilization in Retailing Meat and Meat Products. Analysis of labor utilization in the retail meat department shows wide variation in costs of processing whole cuts into retail cuts. These findings point up the potentials of more effective planning and coordination in the overall operation of the meat department and stress the necessity of analyzing individual commodity costs in appraising pricing efficiency. Additional data are being collected to determine the impact of special features on store, department, and commodity sales and to develop prediction equations. These data along with that previously collected will be used to appraise the pricing efficiency of the retail marketing system for meats and develop techniques that will reduce marketing costs and increase sales of meat products.

## C. Poultry and Eggs

(1) Sales Effectiveness of Selected Advertising and Promotion Techniques for Broilers. Sales data from a 6-week test in two Ohio cities were analyzed to determine effects of week-to-week changes in pricing and merchandising on broiler sales. Fluctuations in broiler movement in sample stores were found to be explainable chiefly by changes in broiler price, display area, and newspaper advertising. These stimuli were found to exert their greatest influence on broiler sales when all were used to feature broilers. Estimates of the effect on sales of price change, amount of display space, and newspaper advertising were made. Additional work is now underway to analyze the principal factors associated with the change in the farm price of broilers over a 10-year period. Broiler advertising lineage in a sample of 60 U. S. newspapers during the second week in each month has been compared with prices received by Georgia producers during 1954-61. Over 80 percent of the variation in farm prices during this period is explained by broiler supply, cold storage holdings, the wholesale price index, season of the year, and retailer advertising. The analysis of retailer advertising indicates that it tends to be heaviest on a down price. However, it appears that increased retailer advertising does strengthen the farm prices in subsequent months.

## D. Grains and Forage

(1) Economics of Inventory Control and Ingredient Procurement in Feed Manufacturing. Tests comparing the cost of six feeds formulated by linear programming with those in actual use indicate cost savings averaging \$1.50 per ton. In addition to an evaluation of potential savings from the use of LP versus conventional (hand formulation), evaluations have been made of the impact of LP solutions in ingredient availability, inventory levels and stock-outs, selection of the optimum length of the review period for reformulation, comparative costs of alternative formulation objectives and uses of supplementary data from LP output for procurement planning, for altering nutrient specifications, and restrictions on ingredient use. A comprehensive



procurement and inventory model has been developed and tested. Preliminary results indicate that the model is functionally sound and promises substantial savings particularly when applied by multiplant firms.

#### E. Citrus and Subtropical Fruit

(1) Effect of Packaging on Sales of Fresh Grapefruit. Tests conducted in a sample of supermarkets in the Paterson, New Jersey, area indicate that packaging grapefruit in consumer size units significantly increased the sales of fresh grapefruit. Compared with test fruit (size 96) offered loose or in bulk displays; sales increased 63 percent when grapefruit was offered in grower labeled polyethylene bags. A 28 percent increase was obtained by offering the grapefruit in plain unlabeled polyethylene bags and a 38 percent increase was realized when both unlabeled bagged fruit and loose fruit were offered from a combination display. All packages contained 6 fruit and both packaged and loose fruit were offered at the same multi-unit (6 fruit) price. Indian River pink grapefruit was used in all tests.

(2) Effect of Promotion on Sales of Frozen Concentrated Orange Juice and Returns to Producers. An analysis of the sales response and effectiveness of the 1959 special promotional campaign for frozen concentrated orange juice has been completed and the findings published. Additional data on changes in advertising expenditures during this period by all segments of the industry are now being analyzed and related to shifts in demand during the 1959 promotion. Effects of the total promotional effort on grower returns are being estimated. Preliminary findings indicate that the 13 percent increase in demand for frozen concentrated orange juice in 1959-60 as compared with 1958-59, was accompanied by a threefold increase in total advertising expenditures for the product. However, the estimated dollar returns to citrus industry was about three times as great as the increase in advertising expenditures. Other findings indicate an increase in grower returns of 25 to 30 cents per box as a result of increased promotion. This work is nearing completion and a report will be issued in early 1965.

An evaluation of the 1962 special promotion campaign for frozen concentrated juice has been completed. Findings indicate 2.5 million more gallons of juice were sold in September through mid-December 1962 as a result of the promotion. It is estimated that a reduction in retail price of 3 cents per 6-ounce can would have been required to move the same volume of juice into consumption. Such a price drop would have reduced retail revenues approximately \$16.8 as compared to the promotion campaign cost of \$3.5 million. Because of the severe freeze that occurred in Florida on December 12 and 13, 1962, it was not possible to appraise the influence of the campaign beyond December 15, 1962.

(3) Consumer Purchases of Citrus, Citrus Products, and Other Products. On a monthly basis, only about 20 percent of the Nation's families have bought frozen concentrated orange juice during the 1963-64 crop year, about the same as in 1950-51. From 1954 to 1962 the proportion buying was close to 30 percent. The proportion of families buying canned orange juice dropped from around 15 percent per month in 1950-51 to 4 percent in 1963-64, and the proportion buying canned grapefruit juice was down from 10 to less than 5 percent. In like manner, the proportion of families that buy fresh oranges and grapefruit also is well below levels that prevailed in the early 1950's. Prices paid for frozen concentrated orange juice were record high in 1963-64, but even so, consumer expenditures were down from the 4 preceding years. Expenditures for other canned citrus juices also were down despite higher prices. On the other hand, consumers are buying canned fruit drinks in increasing volume. Purchases in the first half of 1963-64 were about equal to the amount bought in the entire 1959-60 season. Moreover, the use of canned fruit drinks now exceeds the use of frozen concentrated orange juice and is equal to the use of total canned juices. Use of frozen concentrated fruit drinks also is on the upturn. Indications are that recently introduced synthetic fruit drinks are gaining consumer acceptance.

(4) Market Development for Desert Citrus. Work being conducted under cooperative agreement with the Arizona Agricultural Experiment Station is directed toward an evaluation of the potential of the desert citrus industry, identifying major marketing problems and appraising the effectiveness of alternative marketing techniques designed to promote the consumption of fresh citrus. Data for the desert grapefruit industry showing trends in acreage, number of bearing trees by variety, production, utilization and prices received have been developed and published. Data have been collected as a basis for projecting supply of desert citrus by type and variety through 1967. Local and regional markets for desert citrus are now being studied to delineate the characteristics of market outlets available and to determine promotion and merchandising practices of growers and shippers. Additional plans are being developed to evaluate alternative merchandising and promotional practices of producer groups marketing citrus in the area.

(5) Long-Term Sales Effects of Advertising and Promotion for Florida Citrus. Analyses show definite upward shifts in the demand for oranges during selected periods from 1920-21 to 1960-61. Demand shifts for grapefruit were generally upward until the early 1950's when a downward trend began. Insufficient data are available to relate demand shifts to specific market factors and promotional investments and the work has been discontinued.

#### F. Deciduous Fruits and Tree Nuts

(1) Expanding Markets for Peaches. Work carried out in cooperation with the Washington State Fruit Commission and Washington State University includes studies of market distribution of Washington peaches and a pilot test of the impact of various merchandising and promotional techniques on sales. Information on utilization and market distribution has been collected and



analyzed and will be released through the Washington State Experiment Station. Findings indicate that about two-thirds of the peach crop is utilized for processing with the remainder sold fresh in nearby markets. Findings of controlled experiments designed to measure the effectiveness of alternative merchandising and promotional techniques were inconclusive because of unusual supply conditions during 1963. Further work is in progress to appraise the effect of retailer promotion and other factors on movement and prices received by producers.

#### G. Flowers, Ornamentals, and Shade Trees

(1) Effect of Merchandising and Promotion Practices on Sales and Demand for Floricultural Products. Work currently underway includes: (1) A nationwide survey of approximately 4,000 retail florists to determine merchandising, advertising, pricing, procurement, credit, service, and other operating practices; (2) analysis of economic and demographic factors as they relate to the demand for flowers; (3) evaluation of specific promotional efforts by individuals or groups; and (4) a review and summary of published research relating to marketing floral products. Completed questionnaires have been returned by approximately 2,000 or 50 percent of the sample of retail florists.

Results of an analysis of FTD wire orders show that 99 percent of the changes in number of wire orders from 1930-63 can be related to four factors--disposable income, number of military personnel on active duty, deaths and marriages. Disposable income was most highly related to wire orders, explaining 95 percent of the fluctuations. This variable represents increase in population, change in number of employed persons, and general economic growth.

Two instances of television promotion are being evaluated. One promotion was conducted for a year by 10 florists in the Binghamton, Johnson City, and Endicott, New York, area. Sales data of participating as well as non-participating florists show no significant response in total sales volume. Additionally, a television campaign involving 16 florists in the Lancaster, Pennsylvania, area during the period September 1963 to May 1964 is being evaluated. Again gross sales indicate no significant response to the promotion. In both instances an analyses of wire orders will be made to measure their reaction to the promotions. Additionally, annual wire-order sales in the two test areas involving promotion and in other cities or areas of similar size will be analyzed in relation to: (1) Number of resident telephones; (2) number of business telephones; (3) industrial employment; (4) buying power; (5) hospital admissions; (6) drug sales; (7) general merchandise sales; and (8) deaths.

A review of marketing research relating to floral products has been completed and is now being reviewed for publication. This includes a summary and discussion of published research results and a biographical listing.

## H. Cross-Commodity

(1) Use of Point-of-Purchase Material in Retail Food Stores. About 3.6 million pieces of point-of-purchase material or an average of 127 pieces per store are being used by U. S. retail food stores having annual sales of \$300,000 or more. Use of these materials varies among geographic regions and by store management, but size of store is the major factor affecting the quantity used. About 14 percent of all materials displayed promote nonfoods. By far the most dominant type of material used is the price card. Posters, pennants, streamers and banners as a group ranked second and was the major type of material supplied by food processors and agricultural promotional groups. Retailers supplied more than half of the material used. There is little relationship between the quantity of material used in the various store departments and their contribution to total store sales. Color is considered essential to effective material and material that emphasizes price is rated highly. A slight majority of respondents favored material that promotes more than one product. Point-of-purchase material supporting advertised products has a much better chance of being used than material for non-advertised products. There was little agreement among respondents as to products best or least suited for promotion, although produce was named most often as best suited. Store personnel put up the majority of material used in the store but most store managers prefer that the supplier place the material. Among corporate chains headquarters officials play a decisive role in making decisions regarding use of point-of-purchase material. Point-of-purchase materials that are requested by the retailers stands a much better chance of being used than material received without request. Nonuse or waste of point-of-purchase material as estimated by respondents varied markedly but 60 percent of the store managers reported using 70 to 100 percent of the material received.

(2) Food and Beverage Inventories for Civil Defense Planning. Measurement of food stocks and beverages at the wholesale level of distribution has been completed and the findings published. Work involving county estimates of retail food stocks is now underway. This includes an examination of the accuracy and reasonableness of their estimates and the development of more satisfactory methods for inputting inventory data at the county level. Field-work has been completed on the measurement of food stocks and beverages on inventory in away-from-home eating establishments. Completion of this work will provide civil defense officials with inventory information in the major segments of the distribution system.

(3) Expenditures of Agricultural Commodity Promotional Groups. Preliminary results of a nationwide survey indicate approximately 1,200 commodity groups directly involved in conducting domestic promotional programs for products produced by their members. An additional 310 organizations are indirectly engaged in promotion through contribution of funds to parent or affiliated organizations. These organizations in total spent about \$86 million during 1962 on domestic promotion and indicated larger expenditures were planned for 1963. There were 26 organizations engaged solely in foreign promotional activity during 1962 spending 3.5 million dollars in this area.



Seventeen organizations conducted both domestic and foreign promotion spending \$11.5 million for domestic and \$.9 million for foreign promotional activities.

(4) Economics of Space Allocation and Inventory Control in Retailing Frozen Foods. Cost data and procedures have been developed as guidelines for inventory control and space allocation of frozen foods. Data obtained from a controlled experiment are being analyzed to determine the effects of variation in total space devoted to frozen foods and food groups on retail sales volume.

(5) Economics of Retail Featuring of Selected Commodities. Initial plans have been made and a model constructed for examining the effects of weekly retail features on sales of the product over time, sales of other commodities, total store volume, customer traffic, and prices at various levels in the marketing system.

(6) Impact of Discounting on Food Distribution. Fieldwork has been completed on a study which examines food discounting and its impact on conventional food distribution in 20 Standard Metropolitan Statistical Areas. Tabulations of data are now near completion and analysis has begun.

(7) Evaluation of Amsterdam Trade Fair Exhibition and Symposium. Research is underway to measure quantitatively and qualitatively the influence of the Amsterdam Exhibition and Symposium on the demand for American products in Western European Countries and the image of U. S. agriculture and the importance to the Atlantic Community of more liberal trading policies. Formal survey and audits being conducted under contract by a private research firm will be completed in November 1964. On-the-spot interviews conducted by Department personnel at the time of the Exhibition and Symposium found general approval and sympathy with the purpose and objectives of the Symposium and that it offered means of fostering a better understanding of agricultural trade problems. Respondents offered suggestions for improvement including providing a greater opportunity for delegate participation and directing sessions to solutions of practical problems affecting trade. Similarly it was found, from the reaction of those attending, that the Exhibition was successful in achieving objectives directed toward consumers --namely, introduction of U. S. food products, methods of preparation and projecting the benefits of free trade policies. Many of those attending the Exhibition apparently expected it to be major agricultural and food technology exhibits rather than primarily a trade fair. The film shown as an introduction to the Exhibition was well received.

(8) Inventory Control in Grocery Warehouses. A profile of sales of a cooperating grocery wholesaler indicates that 2 percent of the items handled accounted for almost a third of dollar sales volume and 6 percent of the items (260) accounted for one-half of the sales volume. About 35 to 40 percent of inventory will be in the top selling 6 percent of the items. Inventory control procedures are being developed that will stress strict control

of fastest moving items with less stringent control for medium and slow movers. Information is being collected to compute the economic order quantity and lead time from various vendors.

## PUBLICATIONS -- USDA AND COOPERATIVE PROGRAMS

### Poultry and Eggs

Brown, Sidney E., May 1964. Retail Sales of Broilers and Meat as Affected by Price, Display Area, and Newspaper Advertising, ERS-180, pp. 12.

### Citrus and Subtropical Fruit

Johnson, Clive E., monthly reports October 1963 through September 1964. Consumer Purchases of Citrus Fruit, Juices, Drinks, and Other Products. (CPFJ Series).

### Deciduous Fruits and Tree Nuts

Smith, Hugh M., and Frye, Robert E., February 1964. How Color of Red Delicious Apples Affects Their Sales, MRR-618, pp. 11.

### Cross-Commodity

Brown, Sidney E., March 1964. The Use of Least-Squares Analysis to Evaluate Promotional Features. Presentation, The Operations Research Seminar of the Advertising Research Foundation, New York, pp. 8.

Henderson, Peter L., Brown, Sidney E., and Hind, James F., June 1964. On Methods: Nonquantified Adjustment of Seasonality in Time Series Data. Article, Journal of Advertising Research, Vol. 4, No. 2.

Hoofnagle, William S., December 1963. The Effectiveness of Advertising for Farm Products. Reprint, Journal of Advertising Research.

Leiman, Martin, April 1964. Marketing in Progress -- Patterns and Potentials. (Textbook) "Retail Food Operations by Discount Houses." Publishing company: Holt, Rinehart, and Winston Inc., New York. pp. 4.

Ott, Leland E., March 1964. Optimal Determination of Short-Run Pricing and Advertising Strategies for Food Retailers. Presentation, The Operations Research Seminar of the Advertising Research Foundation, New York. pp. 6.

Van Dress, Michael G., May 1964. Shopping Behavior of Customers in Modified and Conventional Layouts of Retail Food Stores, ERS-183, pp. 28.

\_\_\_\_\_, October 1963. Estimated Number of Days' Supply of Food and Beverages in Warehouses at Wholesale, 1963 -- A Civil Defense Study, MRR-632, pp. 24.



#### AREA 4 DISTRIBUTION PROGRAMS

Problem: For several decades, farming has outrun the manufacturing and distributing industries in achieving greater average production efficiency. An orderly adjustment to this technological revolution has been facilitated by continuing efforts to expand commercial markets and to utilize excess agricultural productive capacity in supplementing diets of children and needy persons. In August 1964, the Food Stamp Program for needy persons was shifted from a pilot effort to a full fledged Program--a part of the overall domestic food aid operation which includes also the National School Lunch, Special Milk, and Commodity Distribution Programs.

There is continuing need for research which will contribute to the attainment of the objectives of distribution programs--constructive use of surplus agricultural resources and improved nutrition for eligible recipients. Primary research relating to consumption, markets, and distribution and research relating to operational effectiveness assist program administrators in the development of new and the modification of existing programs. Findings relating to attainment of basic objectives and the impact of current or alternative distribution programs upon markets for agricultural commodities, prices, and farm income provide guidelines for broader policy determination.

#### USDA AND COOPERATIVE PROGRAMS

The Department conducts a continuing program of research, basic and applied, which is designed to facilitate the full and effective use of distribution programs in creating an expanded market for agricultural products and improving the national health. The primary research effort is concerned with development of new information through special surveys and the application of findings to the operation of distribution programs. Although projects may be undertaken independently, most involve the joint efforts of agricultural economists, human nutritionists, and program specialists.

The distribution programs research staff has its headquarters in Washington, D. C. This staff conducts surveys throughout the United States and supervises work performed by contractors and other Government agencies. One cooperative project is underway with the Minnesota Agricultural Experiment Station.

The Federal scientific effort devoted to research in this area during the past year totaled 3.8 professional man-years. Of this number, 2.3 was devoted to evaluation of food stamp and direct distribution programs; 1.3 to school lunch and special milk programs; 0.2 to away-from-home eating and other related studies.



## PROGRAM OF STATE EXPERIMENT STATIONS

No reports applicable.

### PROGRESS -- USDA AND COOPERATIVE PROGRAMS

#### Cross-Commodity

##### A. Food Stamp and Direct Distribution Programs

During the past year, research efforts have been directed primarily toward evaluation of operations of the Food Stamp Program, with particular reference to adequacy of food coupon purchase requirements.

(1) Surveys of Household Food Consumption and Expenditures. During May-June 1964, a one-time survey of food and other expenditures by eligible families not participating in the Food Stamp Program was conducted in St. Louis, Mo., at the joint request of the Federal, State, and local agencies concerned. Information was obtained from 836 families in 8 selected size and public assistance categories. A preliminary administrative report has been submitted to the sponsoring agencies. Findings indicate that coupon purchase requirements generally met Program criteria; however, limited downward revisions were suggested in the schedules for large families. Revisions also were recommended in procedures used in computing the income basis for purchase requirements. Later reports are planned on food and other household expenditures by needy families and their implications to food aid programs.

The second wave of a survey of household food consumption among low-income families was conducted in Escambia County (Pensacola), Florida, during October-November 1963--after initiation of the Commodity Distribution Program there. Tabulations now are available for evaluating the effectiveness of commodity distribution programs in expanding consumption of foods by needy families.

(2) Findings from Surveys of Retail Food Store Sales in rural Avoyelles Parish, La., indicate that retail sales increases of approximately 7 percent (seasonally adjusted) resulted from initiation of the Food Stamp Program. A major rise in meat sales was recorded--and substantial increases in sales of dairy and bakery products.

(3) Direct Distribution. Research on intra-State distribution of Federal commodities was terminated without a formal publication because of obsolescence of data. Rapid changes have occurred in operational procedures in part arising from implementing of recommendations provided in the earlier administrative report.

## B. Evaluation of School Lunch Program.

(1) Market for Food in Schools. Reports on availability of school lunch services to pupils in public and private schools have been completed. Also a report has been prepared on foods used in the \$1 billion school food service outlet. In the 5-year period since 1957-58, the wholesale value of foods used in public school lunchrooms increased by \$332 million or 56 percent. Wholesale food prices, in contrast, rose only 6 percent. This substantial gain reflected primarily the increased availability of school lunch services (to an additional 7.5 million children in public schools) and expanded per capita consumption of meat, poultry, and milk.

(2) Central Food Preparation and Distribution in Urban School Systems. This research was initiated in response to a request from the Senate Committee on Agriculture and Forestry for a study of nonparticipation in the School Lunch Program because of inadequate physical facilities with a view of developing methods whereby such schools may be able to become participants.

A publication is nearing completion which is based upon research conducted under contract--and supplemented by information developed through the National School Lunch Program Advisory Committee. This report aims to facilitate planning and implementing by local school administrators of central food preparation and distribution systems through which Type A lunches under the National School Lunch Program may be made available to children in older schools. Procedures relating to 5 alternative forms of the Type A lunch are presented, together with cost and performance data and evaluation of problem areas.

## C. Evaluation of Special Milk Program.

A report has been prepared on milk services available to pupils in public and private schools. Preliminary findings indicate that the value of fluid milk consumption, per pupil, increased from about \$8.94 during 1957-58 to \$10.02 during 1962-63. Per capita consumption of other dairy products, including butter, increased moderately from \$1.82 to \$1.98. During the same period, the number of public school children having access to school milk increased by 8 million--from 30 to 38 million children.

## D. Away-From-Home Eating and Related Studies.

(1) Away-From-Home Eating. During the past year, preliminary plans for research relating to evaluation of this multi-billion dollar outlet for foods have been completed by a joint committee representing a cross-section of the food industry and the Department. Industry support for this research program is being generated by a group spearheaded by the Institutional Food-service Manufacturers Association.

(2) Study of Consumption Patterns of Moderately High Income Families. A preliminary study was undertaken under cooperative agreement with the Minnesota Agricultural Experiment Station to develop information concerning consumption patterns of moderately high income families which would provide indicators of future changes in demand for agricultural products and marketing services. A report on the conceptual basis has been published. Also, proposed methodology has been developed and is ready for testing.

(3) National Household Food Consumption Survey, 1965. Preliminary action also has continued in cooperation with the Consumer and Food Economics Research Division, ARS, in planning and pre-testing the proposed decennial food consumption survey.

#### PUBLICATIONS -- USDA AND COOPERATIVE PROGRAMS

##### Cross-Commodity

##### Evaluation of Food Stamp and Direct Distribution Programs.

Brooks, Thomas M., August 1963. Food Consumption Under The Food Stamp Program. NFS-105.

Havas, Nick, May 1964. The Pilot Food Stamp Program--Impact on Retail Food Store Sales in Avoyelles Parish, La., AER-55, pp. 10.

##### Evaluation of School Lunch Programs.

Kriesberg, Martin, August 1964. Market for Food in Schools. ERS-195, pp. 4.

##### Away-From-Home Eating and Related Studies.

Burk, Marguerite C., August 1964. Development of a New Approach to Forecasting Demand. Paper No. 1167, Miscellaneous Journal Series, Agricultural Experiment Station, University of Minnesota, pp. 15.



## AREA 5

### TRANSPORTATION COST AND SERVICES

Problem: Transportation cost and services research--as related to farm products and farm production supplies--is concerned with learning where farm products and supplies move, how they move, why they move the way they do, and how they could be moved better for less money.

Data pertaining to these subjects are readily available for some areas and not for others. Reliable data for rail transportation are collected by Government agencies; for highway and for waterway transportation they are not.

Interstate--as well as most intrastate--truck transportation of unprocessed farm products is provided mostly by truck owners who are exempt from public regulation insofar as freight rates, charges, and routes traveled are concerned. These carriers do not file financial and statistical data with public regulatory agencies. For that reason good truck statistics are not available.

Farm products move by inland waterway in bulk form--unpackaged, unmarked, and uncounted--as well as certain farm supplies and other nonfarm products under much the same unregulated conditions as unprocessed farm products move by truck.

The motortruck and barge exemptions contribute to geographical flexibility and economical transportation operations, but these exemptions also create important data gaps.

Because of these gaps transportation research involves the collection of basic data as well as the analysis of these data. The Department is working --or plans to work--in the following areas:

1. Origin and destination statistics (i.e., tons, ton-miles, etc.) for exempt highway and waterway transportation, separated by classes of commodity.
2. Freight revenues collected by highway and waterway carriers, separated by geographical areas and by classes of commodity.
3. Highway and waterway carriers' operating costs, separated by area of operations and by classes of commodity.
4. Indexes of rail, motortruck, and barge freight rates for farm products and farm production supplies.



5. Origin and destination statistics for air freight movement of farm products and charges made by the carriers for hauling such products.

#### USDA AND COOPERATIVE PROGRAM

Transportation is a rapidly changing industry. New and improved methods of transporting farm products and supplies, drastically changing rates and rate structures, increased intermodal competition, and an awareness of the need for new "rules of the game" as indicated by the many proposals for new legislation are evidence of the transformations taking place in the field of transportation.

In view of the many significant developments in transportation the Transportation Cost and Services Group of ERS is changing its research emphasis. It is moving from the case analysis--descriptive type of program--to one that emphasizes the reasons for changing transportation conditions and situations with a view to better understanding for the future. With this new emphasis the Group has started to collect more detailed information for use in building "transportation models" and applying linear programming techniques. The new data will be used for computer determination of selected transportation problems associated with freight rates, traffic flow patterns, and with the economics of location.

Transportation research activities are largely of a cross-commodity character, but some work concerns only one commodity or a group of related commodities. The work could be divided as follows: grain and forage, 2.5 professional man-years; vegetables, 1.4 professional man-years; and cross-commodities, 5.9 professional man-years. Except for a study done under contract for grain transportation in the Southwest and one on grain transportation in the Northwest by one person residing at Bozeman, Montana, research in transportation was conducted by nine persons on the Washington staff.

#### PROGRAM OF STATE EXPERIMENT STATIONS

Most of the research at the State Experiment Stations concerned with transportation is reported under commodity groupings. Only those studies which fail to lend themselves to a specific commodity are discussed here. One State is studying the impact of the interstate highway system on the movement of farm products. This study seeks to determine the present transportation costs and the structure to major markets for important farm products produced and/or processed in the State, to estimate the effects of the new interstate highway system on the cost and time structure for moving products produced and/or processed in the State to major markets, to evaluate the effects of the altered transportation cost and time structures on the location of processing and distribution facilities within the State, and the movement of raw and processed farm products within the State and to

principal markets outside the State. The other study is concerned with the transportation services and costs for trucks, rail, barge, and air freight service. Possible improvements in the transportation services and costs are being examined for their effects on the marketing of agricultural products from the area. One professional man-year is devoted to these studies.

## PROGRESS--USDA AND COOPERATIVE PROGRAMS

### A. Grain and Forage

1. Grain Transportation. Changes in grain transportation rates and increased competition among rail, highway, and water carriers have caused many changes in the marketing of grain and products thereof. Historically, grain was transported mostly over rail routes utilizing rail "transit" arrangements, diversion privileges, and other services permitted under rail tariffs for movement through major grain terminals to processors and consumers. Increasing rail rates since World War II have encouraged grain shippers to use trucks and barges more or a combination of these two services with lower rates or better service or both.

The transportation services provided by highway and waterway carriers do not include "transit," diversion, or other privileges. To meet their competition railroads have initiated new lower nontransit, high-volume point-to-point rates. These new rates are much lower than the old customary rates and are competitive with highway and waterway carriers. The adjustments of the grain industry to these changing transportation charges and services have caused significant new trends in grain marketing.

To keep abreast of these changes surveys of grain transportation have been conducted for most of the major grain marketing regions in the United States. The regions that have been researched directly or under contract include the North Central States, the Northwest, and the Southwest.

All these studies show that grain is being shipped more and more by highway and inland waterway or a combination of them. Rail transportation volume has failed to grow as rapidly as truck and barge volume; and the share of total grain traffic being moved by rail has tended to decline, particularly in areas where good highway and waterway services have been offered to shippers. Keener competition among the different types of carriers has caused shippers' unit charges to decline. This downtrend in unit charges began in some areas in 1958 and has been spreading to more and more areas since that time.

2. Hay Surplus Production Areas and Deficit Areas and Transportation Charges. Since the sources and markets for hay are not well defined, research has been completed to measure normal hay production patterns in the United States and to indicate areas where hay is normally produced in excess of current needs and areas where hay is normally being imported. This has been a joint effort of the Federal Extension Service and Economic Research Service.

Normally about 117 billion tons of hay are produced annually in the United States, but only around 15 percent of that amount enters commercial channels. The North Central States usually have hay for sale and for export out of that area. New England States usually import. Production in other States varies with the weather, some occasionally export and others occasionally import.

A second phase of this project will determine usual hay flows in commercial channels and transportation charges paid by shippers for moving hay from surplus areas to deficit areas.

## B. Fruits and Vegetables

1. Transportation of Fresh Fruits and Vegetables. This is a two-phase project dealing with interstate rail and highway transportation of California and Arizona fruits and vegetables and is concerned with the flow patterns and trends associated with rail and highway movement of fresh produce from California and Arizona to other States.

Striking changes have taken place in the use of highway and rail carrier service. Since 1951, the share of interstate traffic dispatched from California and Arizona shipping points by rail has dropped from 87 to 70 percent of total movement from those areas. The decrease has occurred primarily because shipments moving to points west of the Mississippi River --short and intermediate range hauls--have been tending to go more and more by truck. Trucks have increased their share of shorthaul traffic from 67 to 83 percent of the total and their proportion of intermediate range hauls from 20 to 66 percent. These shifts in shippers utilization of carriers reflect the motor carrier's ability to offer attractive rates and fast service. In many instances motortruck transportation has become so much more attractive than rail service that some users are willing to pay higher charges for truck service than they would have needed to pay for the nearest comparable rail service.

The second phase of this study, based on receiver interviews, is scheduled for completion by December 1964. Preliminary findings confirm those of the shipper survey. Receivers utilize rail and truck service to improve plant operations and to serve customers better.

2. Fresh Potatoes. A preliminary survey of fresh potato transportation was made during the year. Shipments from the major production areas to markets have been affected markedly by many factors, including transportation. Together all forces have caused Idaho to become the nation's largest potato producer and Maine the second largest. These two States changed positions in 1957 despite the fact that Maine is much closer to a larger portion of the nation's population than Idaho. Very favorable rail freight rates have helped Idaho. Truck transportation, which is usually used for short and intermediate range hauls, is more costly than rail except where truckers are able to haul potatoes as a "filler" payload on an otherwise empty segment of a round trip circuit.



### C. Rate Indexes

1. Rail Freight Rate Indexes. A new set of indexes of rail freight rates for farm products has been prepared in accordance with instructions of the Bureau of the Budget dated May 10, 1960. The base period has been changed from 1947-49 to 1957-59. At the same time the revised indexes have been modified to reflect the current flow patterns.

The new index numbers include nine major groups of 33 farm commodities. The major groups are: livestock, meat, fruits and vegetables, wheat, all grains (including wheat), soybeans, cotton, wool, and tobacco.

2. Ocean Freight Rate Index. Data are being assembled from published sources that will permit the construction of a freight rate index for ocean transportation of farm products by nonscheduled ocean liner service.

### D. Locational Price-Support Differentials for Wheat

1. Price-Support Differentials for Wheat. This research involved constructing and solving a transportation model for wheat. Results were used by Department officials as an aid in establishing the level of support prices. Preliminary findings indicated that transportation charges are a major factor in spatial price patterns. Changes in transportation rates and transportation rate structures sharply and swiftly alter traditional marketing channels. Resulting pressures on locational price levels affect historical production patterns which benefit some areas and injure others.

More accurate freight rates for moving grain by highway and waterway are needed for reliable results from the use of transportation models and for guidance in connection with price-support programs and public policy decisions.

PUBLICATIONS--USDA AND COOPERATIVE PROGRAMS

Cotton and Cottonseed

Potter, Joseph R. May 1964. The Traffic Pattern of Raw Cotton Shipped from Warehouses in the United States, 1961-62, ERS-184. 8 pp.

Grain and Forage

DeWolfe, Mildred R. August 1964. Hay in the United States: Quantities Grown in a Normal Year, Surplus and Deficit Areas, Statistical Bulletin No. 349. 98 pp.

Vegetables

Bennett, Robert M. August 1964. Interstate Hauling of California-Arizona Fresh Fruits and Vegetables by Rail and Truck, MRR No. 673. 36 pp.

Cross-commodity

Ulrey, Ivon W. November 1963. The Role of Railroads in Hauling Farm Products, ERS-149. 9 pp.

Hunter, John H. March 1964. Shipping Farm Products Abroad in the Jet Age, Foreign Agriculture. 3 pp.

Wright, Bruce H. March 1964. For-Hire Trucking of Exempt Farm Products--Operating Practices and Nature of Competition, MRR No. 649. 38 pp.

## AREA 6

### ANIMAL PRODUCTS

Problem: The purpose of this research is to find solutions for economic problems in marketing dairy, poultry, and meat animals and their products. More specifically, it is to find answers to the needs of farmers, marketing agencies, and the public for economic knowledge about these commodities--needs for economic knowledge that is relevant to marketing decisions and to the shaping of public policy and programs. This project includes studies of margins, costs and efficiency; of the structures of the systems for marketing individual products; and of the methods and practices followed by farmers, marketing firms, and related public agencies. It provides accurate information about the form and working of the marketing system as a basis for initiating desirable changes and for keeping all parts of the system abreast of technological and economic progress.

### USDA AND COOPERATIVE PROGRAM

The Department has a continuing long-term program of economic research to assist farmers and marketing agencies to adapt to changes in the environment in which they operate. Work in this area is conducted at Washington, D. C. and in cooperation with State agricultural experiment stations at Durham, N. H., Athens, Ga., St. Paul, Minn., Ames, Iowa, Fort Collins, Colo., Stillwater, Okla., and College Station, Texas. The Federal scientific effort devoted to economic research in this area totals 33.3 professional man-years, distributed as follows: dairy 10.0, swine 0.4, beef 0.5, livestock (cross-commodity) 10.7, and poultry and eggs 11.7. By functional areas, it is distributed as follows: structures, practices and competition 15.0, product quality 3.1, information, outlook and rural development 0.7, and margins, costs and efficiency 14.5.

### PROGRAM OF STATE EXPERIMENT STATIONS

All the State experiment stations are conducting economics research dealing with the marketing of animals and animal products.

Dairy marketing research is concerned with the structure, marketing practices and the competitive position of the dairy industry; the effect of promotion and advertising on the sale of milk and dairy products and the margins, costs and efficiencies involved in the assembly, processing and distribution of milk and dairy products. Four regional projects are underway. NCM-26 and WM-46 are investigating structural changes occurring in the dairy industry in response to changes in supply, demand, technology, economic and institutional factors and the effects of these changes on the performance of the



firm and the industry. SM-10 is studying the institutional forces affecting the Grade A milk industry, the supply of milk for manufacturing, the movement of milk to market areas and plant organization and operations. NEM-25 is evaluating economic adjustments in the assembly, processing and distribution of milk in response to changes in labor costs, technological advance and other developments.

The State effort devoted to dairy marketing research amounts to 38.11 professional man years.

Livestock marketing research deals with the economic problems involved in the marketing of beef, swine, sheep and wool. The major part of the work is in the areas of structures, practices and competition; merchandising and promotion; product quality; margins, costs and efficiency and transportation. Four regional livestock marketing projects are underway. NCM-25 investigating needed adjustments in production relative to prospective demand and is determining the effect of production, consumption and transportation costs upon market structure. WM-39 is designed to show the nature and extent of direct marketing, and costs and returns from different methods of marketing. WM-48 is concerned with the market organization of the livestock industry in the West and is studying Western and Central markets for feeder and fed cattle and the volume-cost relationships for meat distribution. SM-23 is investigating meat and livestock movements and the role of transportation cost regarding the location of livestock production and processing facilities.

The State effort devoted to livestock marketing research amounts to 32.02 professional man years.

Poultry and egg research in the area of marketing economics includes table eggs, egg products and poultry meat consisting of broilers, heavy young chickens and turkeys. The principal areas of work are market structure, practices and competition, costs, margins and efficiency of assembly, processing, and distribution; merchandising and promotion and transportation, storage and interregional competition. Three regional marketing studies are being conducted. NCM-31 is studying the effects of coordinated production-marketing programs and new marketing technology upon market channels and institutions. NEM-21 is evaluating the economic feasibility of alternative egg marketing systems relative to market requirements and the competitive position of the industry. SM-26 is studying the market structure of the broiler industry in the South and the impact of national marketing orders on its economic organization and efficiency.

The State effort devoted to poultry and egg marketing research amounts to 32.7 professional man years of which 15.3 is devoted to egg and egg products and 17.4 to poultry.

## PROGRESS -- USDA AND COOPERATIVE PROGRAMS

### I. Dairy

#### A. Structure, Practices and Competition

1. Price Wars in City Milk Markets. Because of the typical structure of the industries and the nature of the competitive process, it is difficult to have the benefits of price competition among milk distributors without it taking the form of price warfare.

Most of the price wars studied had one or more of these aspects which tended to diminish the performance of the industry: (1) Severely depressed prices; (2) destructive competitive tactics; or (3) wasteful forms of innovation.

Dairy farmers supplying markets affected by price warfare among distributors were substantially protected when covered by Federal orders setting minimum producer prices but their ability to negotiate premiums over these minimums was diminished.

The quality of milk was not affected by price warfare except for a tendency to reduce the butterfat content to the legal minimum under local ordinances.

In spite of certain destructive aspects, price competition (even in the form of price warfare) is required for the satisfactory performance of fluid milk industries--to permit innovation of new forms of packaging, new products, or new ways of doing business. Price competition may perform a similar function when new firms seek to enter a market. Perhaps the most important function of price warfare is in compelling a revision of outmoded structures of prices and practices to enable the industry to maintain a satisfactory pace of progress and to improve efficiency.

The study shows that there is ample vitality of competition in city milk industries provided it is neither stifled (by Government or by the firms themselves) nor allowed to degenerate into a continuous state of price warfare. The taking over by Government of the price-making function would not be conducive to workable competition. It might, however, be useful for Government to experiment with hearing procedures to assist in the formation of price structures in those city milk markets which are plagued by chronic price warfare.

2. Structure of the Dairy Industries. New technology, pronounced changes in distribution and merchandising, and other developments have been accompanied by sharp declines in numbers and increases in average size of dairy marketing establishments and firms which may accentuate antisocial behavior in pricing and other trade practices and impair industry performance.

The sharp decline in numbers and increase in average size of producers has been effected partly by a comparatively rapid turnover of producers. Substantial numbers of medium and large fluid milk marketing cooperatives have been involved in consolidations during the past decade. As a result of this movement and the demise of some of the weaker organizations, the total number of such cooperatives has declined considerably. Remaining organizations are generally larger and provide more marketing functions than their counterparts of the mid-1950's.

Sharp declines in numbers and increases in average size have been occurring among most types of dairy marketing establishments. Technological developments which have increased capital requirements and pushed economies of scale to higher levels have contributed importantly to this trend. Because many single-plant firms have gone out of business, and numbers of plants operated by multi-unit firms have increased relatively, if not absolutely, there have been similar, and perhaps more pronounced, trends in numbers and sizes of firms. Nevertheless, considering all industries and markets, the market shares of the national dairies and other dominant firms have by no means universally increased. In the fluid milk industry, for example, widening of distribution areas has helped to maintain the number of milk distributors competing for outlets in a given population center.

Plants manufacturing dairy products decreased by one-third between 1944 and 1961 but the average number of products made increased from 1.5 to 2.0 per plant. Only one product was produced in 44 percent of the plants in 1961, compared with 72 percent of the plants in 1944. In 1961, about 47 percent of the plants had some degree of diversification, compared to only 10 percent in 1944.

Concentration--the share of the market held by the four largest firms--in fluid milk markets has been increasing in recent years in small markets, but it has declined in the largest. Firms packaging fluid milk have been declining in markets of all sizes. The decline in the number of handlers is not a recent phenomena. It has been going on for at least 75 years.

The greatly expanded role of supermarkets and of chainstore organizations in the marketing of dairy products has been a major structural development. Large numbers of food chains now handle private label brands of fluid milk and ice cream as well as evaporated and dry milk and occasionally butter and cheese. Tied in with this development has been a long term increase in the proportion of most manufactured dairy products shipped directly to chainstore warehouses, bypassing old-line wholesalers and jobbers. In the case of butter, this development has had associated with it an increase in the proportion marketed by cooperative sales agencies.

3. Long-Distance Movement of Bulk Milk. A survey of the long-distance movement (over 200 miles) of market milk in the United States showed that:

(1) In 1960-61 about 424 million pounds of market milk was shipped by over 400 plants mostly in Iowa, California, Virginia, Wisconsin, and Indiana;



(2) States receiving most this milk were Texas, Missouri, and Ohio; (3) most shipments were made on a regular basis; (4) nine haulers, operating nearly 200 tank trucks, hauled most of the hauling; and (5) on the average, hauling rates increased about 16 cents per hundredweight per 100 miles over distances ranging from 355 to 1,444 miles. Where backhauls were available, hauling rates were 15 to 20 percent lower.

4. Marketing Milk in Alaska. A comparison of data for four Alaskan markets --Anchorage, Fairbanks, Juneau, and Kodiak--showed that the following changes had occurred since 1957: (1) Total sales of bottled milk (fresh milk, recombined milk, etc.) increased 18.3 percent although sales of fresh milk declined 13.8 percent; (2) total sales of canned liquid and dry milks increased 30 percent; (3) retail prices for fresh milk rose in 3 of the 4 markets; (4) considerable quantities of fresh bulk milk are being shipped to Anchorage at a cost about 10 percent less than local milk; (5) retail price differences between fresh milk and its substitutes have widened. Another important change since 1957 has been the switch by the Department of Defense of serving troops fresh milk rather than recombined milk.

Local Alaskan milk is being displaced from local civilian and military markets by an increasing volume of fresh whole milk shipped in bulk tanks from the West Coast. This is causing an agonizing reappraisal of the future of the dairy industry in Alaska.

5. Management Information Systems. The efficiency of fluid milk marketing firms and the profits of their owners can be materially increased by providing the managers of these firms with information tailored to their needs. A case study in one firm indicates that nearly all of the basic information needed for greatly improved management decisions was already available within the company. It was being used in reports to a variety of regulatory agencies. By putting this information in a form needed by the decision-makers in the company, it provided a basis for greatly increasing the efficiency of the firm.

#### B. Margins, Costs and Efficiency

1. Costs and Margins of Fluid Milk Distributors. Profits before taxes of fluid milk distributors reached their lowest level in 12 years in 1963. They averaged an estimated 20 cents per hundred pounds of milk and cream processed, about half the level from 1954 to 1961 and about a third that reached during the Korean War. Costs also declined in 1963 but not as rapidly as prices received. These general trends continued into the first quarter of 1964.

2. Efficient Organization of the Southern Dairy Industry. Costs of assembling supplies of fluid milk could be lowered if they were moved more closely to optimum conditions. However, to obtain such conditions would entail considerable reorganization of the assembly patterns in milkshed areas.

The expected patterns of fluid milk distribution at equilibrium in 1975, based on projections of supplies and demand by geographic areas to that period, would be for fluid milk to move generally South from Tennessee and North Carolina, into Alabama, Georgia, and Florida. Some milk would move from the Southern parts of Georgia and Alabama to Florida.

3. Capacity and Flexibility of Milk Manufacturing Plants. Plant milk receipt volumes in the low season of the year represent less than 50 percent of those volumes during the flush period. Milk receipts generally display a relatively long flush period extending from January through June with a peak in March. The low volumes occur quite commonly in September. It is estimated that during the flush season plants are operating between 60 and 90 percent of plant capacity. Plant managers generally see specialization of product as the alternative most feasible and economical for continued operation. Institutional as well as economic factors weigh heavily in the operational decisions of small and medium size plants.

4. Managing Milk Supplies. In the first case study--of a market with an intermediate degree of centralization in management of milk supplies--it was found that greater centralization of management would reduce needed reserves of milk substantially and lower marketing costs. Further case studies--in markets with greater and lesser degrees of centralized management--will serve to pinpoint the costs of decentralized management and savings which are possible.

## II. Beef

### A. Information, Outlook and Rural Development

1. Effects of Shrinkage on Pricing Cattle. Test lots of cattle were followed from Colorado feedlots through marketing channels to packing plants in Denver and Greeley, Colorado, and were weighed at the feedlot, twice at the market (on arrival and when sold) and at the packing plant.

Shrinkage averaged 1.61 percent of initial weight from feedlot to yards or to packer direct, 1.60 percent during stay in the stockyards. Time in transit had largest relation to shrinkage loss, 0.13 percent additional loss for each 10 minutes additional transit time. Shrinkage averaged higher for heifers than for steers. Dressing percent averaged higher for both heifers and steers sold direct to packers, compared to those sold through stockyards.

The 4 percent shrink deducted from sale weight on direct sales was 1.25 percent more than shrink on sales through the stockyards.

### III. Swine

#### A. Product Quality

1. Hog Grading and Pricing. The ultimate volume of live hogs purchased for slaughter is determined by their actual yields of salable cuts, although customarily live hogs are priced on the basis of buyer estimates of yield, usually based on a general relation to liveweight. Variability in actual yield among individuals' lots, weight ranges, and other factors suggest that more accurate pricing practices could be developed if relation of various factors associated with variation in yield were measured.

Analysis showed that 94 percent of the variation in value among carcasses was explained by variation in weight of carcass and weight of four lean cuts as percent of carcass weight. Equations were developed showing relations between weight, length and backfat thickness, and yield of lean cuts.

On this basis, suggested pay-price differentials were developed (a) between grades (b) with various changes in relative prices of pork cuts.

### IV. Livestock

#### A. Structure, Practices, and Competition

1. Competitive Position of Texas-Oklahoma. Potential fed beef markets for Texas and Oklahoma are mostly in the South and Southeast. Texas and Oklahoma are at a locational disadvantage with respect to fed beef markets in the Northeast and California. The major competitors of Texas and Oklahoma for fed beef markets in the South are Kansas, Missouri, and Colorado.

2. Outlets for Western Livestock. Studies of feedlot, country market, and terminal market prices for slaughter cattle, indicate no one market outlet consistently furnishing highest prices at all times. Under most conditions, Choice grade steers and heifers were priced higher at country than at terminal markets, with slaughter cows the opposite; and feedlot prices in direct purchases were highest of the three methods.

Larger ranchers were found better suited than small ones to direct marketing, having enough feeder cattle to sort into uniform lots and therefore to gain reduced out-of-pocket costs on cattle shrink in hauling, at the market, and carcass shrink at the packing plant, and on procurement and selling cost under alternative methods of sale.

Analysis of rail and truck rates for hauling cattle in the West showed significant differences between rail and truck by length of haul, average weight per haul, and total weight. Rail rates tend to be lower than truck rates for hauls longer than 200 miles although truck hauls are as much as twice as fast as most rail haulers. Transportation cost was not, however, the prime factor in choice of markets by producers.



3. Simulation of Pricing and Marketing Livestock. Alternative pricing and trading strategies were incorporated into a computer model of the livestock-meat economy, and the prices and outputs under these alternative structures were simulated over both the historical and projection periods. Three forms of wholesale-to-retail margin strategies were simulated--a constant percentage markup, a semi-variable markup containing both a fixed component and a percentage markup component, and a fixed markup which varied with the price index. The variable margin strategy is preferable to the fixed margin inasmuch as the fixed margin restricts output and shows more extreme price cycles. The variable markup (percentage markup) produced a lower average wholesale-to-retail margin than either the semi-variable or fixed margin strategy.

Both a fixed (1958-62 average) and a 4 percent limitation on net foreign trade in beef reduced net imports from 40 to 60 percent. Trade limitation increased the amplitude of the price cycle, but raised average wholesale beef prices approximately one dollar per hundredweight over the 11-year projection period. However, average per capita beef consumption was about one pound lower during the 1964-75 period. This raised the average Choice grade steer price 75 cents over the projection period. Pork prices and per capita consumption of pork were not affected to any significant extent.

A "product utilization control" strategy which maintained a target per capita consumption rate with a two-price system for beef and pork essentially eliminated the price and output cycle. Wholesale beef and pork prices averaged one dollar higher than the historical structure projection in the 1964-75 simulation, and per capita consumption was also slightly higher. However, the Nation would be a major exporter of pork under such a program.

Under the assumption that the 30 day producer holding action lowered the 6 month average price substantially due to the increased marketings of the following 60 days, the long-run effects over the following 9 years showed total production to be about the same with slightly lower prices. The amplitude of the beef and pork price cycles was increased. The buildup in the cattle cycle, as measured by January 1 inventories, was held down for several years. The major result of this simulation is to show the nature of the long-run effects associated with a major short-term market change.

## B. Margins, Costs and Efficiency

1. Marketing Costs and Margins. Changes in price spreads for beef consisted of two parts: Short-run fluctuation and long-term trend. The short-term changes were associated closely with the lag between adjustments in farm and retail prices. The long-term trend was persistently upward at a greater rate than spreads for other meats have increased, and at a greater rate than present indicators of retailer costs or the consumer price index. A possible explanation of this trend is a change in retailer pricing policies which shifts overhead from other commodities to beef.

Meatpacker costs for slaughtering hogs and distributing fresh pork averaged about 3 1/2 cents for wholesale pound output for two quarters in 1962-63. Total costs did not differ appreciably with changing volume, in two quarters, for this sample. About two-fifths each of total labor cost was for killing hogs and cutting carcasses; the remainder for over-filling and shipping room expense. Costs for curing and smoking hams, bacon and picnics amounted to an additional 5 to 15 cents per pound of cured and smoked product.

Meatpacker costs for slaughtering and distributing fresh beef averaged about 3.1 cents for plant costs and an additional 1.1 cents for shipping to distribution centers and local delivery. Two-thirds of total labor cost was for slaughtering, most of the remainder for shipping and cooler labor.

2. Economies of Scale in Meatpacking. The analysis indicated that average cost of slaughtering decreases slightly as plant size increases from 20 to 60 head per hour and increases slightly for plants designed to operate, with a single shift, at line speeds of 75, 90, and 120 head per hour. The average cost estimates for operation at rated line speed were \$6.96 per head for the 20 head per hour plant, \$6.86 per head for the 40 per hour plant, \$6.50 per head for the 60 per hour plant, \$6.65 per head for the 75 per hour plant, \$6.72 per head for the 90 per hour plant, and \$6.89 per head for the 120 per hour plant.

Short-run average costs increased for each size of plant as output increased from 90 to 115 percent of rated line speed. Over the range of plant sizes studied, the average cost decreased an average of \$.47 per head as plant output increased from 90 to 115 percent of rated line speed.

## V. Poultry and Eggs

### A. Structure, Practices, and Competition

1. Pricing Eggs. Egg handlers outside of cities where base price quotations are issued knew less about how quotations are determined than did the egg handlers in those cities. Handlers felt that the base price quotations could be held out of line with true values but only for 2 or 3 days. Transfer of ownership of eggs at various points in the marketing channels is at price differentials below and above the base price quotations, with relatively few at the quotations.

2. Egg Procurement by Large-Volume Distributors. Analysis of large-volume retailers' responses to a survey indicates: (a) Their procurement system for eggs is unique among the commodities handled, (b) long-run decisions are made at the headquarters level while short-run decisions are more apt to be decentralized to a regional or city basis, (c) on the buying side, the basis for arriving at price is changed infrequently, and (d) they leave the problem of balancing supply and demand to their suppliers by ordering only what is needed. Analysis of suppliers' responses indicates: (a) Eggs are the only

commodity handled or are very important, (b) changes in business practices to adjust to large volume retailers demands are mainly automatic grading by machines, payment to producers on a grade-yield basis, and lowered margins, (c) they balance supply and demand by supplying the large-volume retailer's needs and selling the balance to other outlets.

## B. Product Quality

1. Egg Quality and Marketing Costs. Despite the increased importance of quality-control programs, variation in quality of individual producers' eggs remains substantial. This suggests the need for stricter enforcement of programs or their adjustment to more appropriate standards.

## C. Margins, Costs and Efficiency

1. Commercial Egg Industry in the South. Most new technological innovations in egg packing plants are likely to be labor-saving in nature, reducing man-hour requirements. Despite projected increases in factor prices, particularly wage and salary levels, future costs per unit will be reduced. Scale relationships are likely to remain largely unchanged.

More highly integrated firms in the present industry appear to have lower costs in both production and marketing operations. Net returns per unit of product tend to be higher for egg contracting firms and large integrated producers than for cooperative associations and independent receivers. Rate of return on investment was highest for large integrated producers and independent receivers. Differences in all cases are small.

2. Commercial Hatchery Costs. Economies of scale relationships for egg-type chick hatcheries appear similar to those for broiler-chick hatcheries. However, costs per pullet chick produced are more than twice as high for any size hatchery as in producing broiler chicks because of sexing costs, disposal of most cockerel chicks, and the shorter operating season (or lower percent of annual capacity used). For turkey poult hatcheries, most of the potential economies of scale are realized with a hatchery setting about 5 million eggs in a 7 month season.

3. Costs of Assembling and Processing Turkeys. Assembly costs per pound of live turkey tend to rise with firm size due to larger supply areas. Actual costs for firms handling less than 5 million pounds were about 0.3 cents per pound and over 0.5 cents per pound for larger firms. These costs can be reduced slightly by better organization and handling methods, and somewhat more by increasing density of supply areas.

Integration of contract operations with other operations is growing. This is occurring mainly through risk-sharing contracts with feed firms and growing more turkeys on company owned or leased farms. About 20-25 percent of turkey producers secure credit from banks and traditional sources. Production financed by feed companies, processors, and others in the industry amounts to



40-50 percent. Risk-sharing contract production is 25 percent; company production 10-15 percent (above are not completely additive, but overlap to some extent).

4. Transfer Costs for Broilers. Spatial (transfer) costs decline substantially as production density increases from 1,000 to 5,000 pounds per square mile, but the rate of decline between 5,000 and 25,000 pounds per square mile is much less rapid. Total costs for feed milling, chick distribution, live broiler assembly, hatchery and feed mill operation, and processing decline from 6.5 to 5.1 cents per pound of live broiler as integrated organization size increases from a processing plant size equivalent of 600 to 3,600 birds per hour, when density of production is 5,000 pounds per square mile. Larger units experience further but minor reductions in aggregate costs. Costs per ton in milling broiler feeds decline from \$8.61 to \$3.96 per ton as mill size increases from 21 to 348 tons per day when operating at effective annual capacity.

5. Poultry and Egg Margins. Price spreads changed little from 1962 to 1963, but prices have varied at most market levels.

Price specials do have an effect on volume of sales of frying chickens. The price of chickens, however, was the major factor influencing the volume of sales. The price elasticity of demand was -1.75 at the retail level, but less elastic at the farm level.

## PUBLICATIONS -- USDA AND COOPERATIVE PROGRAMS

### Dairy

Butz, W. T. March 1964. Long-distance shipment of market milk. MRR-648, 12 pp.

Carley, D. H. August 1964. Optimum assembly of milk supplies in the Southeast. Southern Coop. Ser. Bul. 92. 36 pp.

Klein, J. E., and Gray, L. R. December 1963. Drive-in dairies in central California. Development, organization, and operation. MRR-636. 11 pp.

Manchester, A. C., and Sitzman, L. Rev. April 1964. Market shares in fluid milk markets. 73 pp.

Reichert, C. F. March 1962 (released 1964). Market organization, promotional activities, and practices of fluid milk plants in the Western region. Oreg. Agri. Expt. Sta. Tech. Bul. 59, Western Reg. Pub. 52 pp.

Russell, S. July 1964. Producer delivery patterns in New England markets. MRR-672. 111 pp.

Wolf, A. F., and Sitzman, L. Quarterly. Milk distributors' sales and costs. 6 pp.

### Livestock

Agnew, D. B. December 1963. Meat packers' costs: Recent interest, methods of analysis and implications. Jour. Farm Econ. 5 pp.

Fishel, W. L., Dubov, Irving, Rohdy, D. D., and Stout, R. C. January 1963. Hog and pork movement in the Southeast. Southern Coop. Ser. Bul. 83. 97 pp. and Statistical supplement No. 2. 80 pp.

Motes, W. C., Bullock, J. B., and Hacklander, D. D. May 1964. Price spreads for beef, ERS-182. 7 pp.

Rohdy, D. D. December 1963. Southeast hog-pork industry: A national market competitor. Southern Coop. Ser. Bul. 89. 96 pp.

### Poultry

Burbee, C. R., and Bardwell, E. T. May 1964. Marketing New England Poultry. 6. Economies of scale in hatching and costs of distributing broiler chicks. New Hampshire Agri. Expt. Sta. Bul. 483. 56 pp.

Gray, L. R. February 1964. Marketing spreads for eggs, frying chickens, and turkeys in selected cities of the United States. ERS-159. 6 pp.

Gray, L. R. July 1964. Effects of price specials on volume of sales of frying chickens. Agricultural Economics Research, Vol. XVI, No. 3. 5 pp.

Jones, H. B. July 1964. Developing plant facilities for grading and packing eggs. Ga. Expt. Serv. Marketing Report 2-3. 20 pp.

Rogers, G. B., and Rinear, E. H. September 1963. Costs and economies of scale in turkey processing plants. MRR-627. 61 pp.

Rogers, G. B., Henry, W. F., Brown, A. A., and Bardwell, E. T. April 1964. Marketing New England poultry. 5. Effects of firm size and production density on assembly costs. New Hampshire Agri. Expt. Sta. Bul. 482. 62 pp.

June 1964. Bulk delivery of feed in New England. New Hampshire Extension Service. 20 pp.

## AREA 7

### FIBERS AND GRAINS

Problem. The structure, location, and marketing practices of the fibers and grains industries are undergoing pronounced changes which are important to producers, marketing agencies, and consumers. The rapidity and magnitude of these changes have resulted in some serious marketing problems which are further complicated by certain farm programs. The causes and results of these changes need to be better defined and evaluated to provide a more adequate basis for increasing the efficiency of the marketing system and making it more responsive to public needs. Specifically, increased research emphasis is needed on changes in the structure and practices of the fibers and grains marketing industries and their effect on marketing cost, efficiency, and product quality. In addition, increased emphasis should be placed upon defining the important quality characteristics of the various fibers and grains and in relating this information to differences in value or price. Such an accelerated program would provide more complete and current information not only to producers and marketing agencies but also to officials responsible for public programs affecting agriculture and to teachers and extension workers.

### USDA AND COOPERATIVE PROGRAM

The Department has a continuing long-term program of economic research in fibers and grains marketing which attempts to reach from the farm to the consumer. Most of the research is problem solving in nature, and is conducted by economists or personnel with both economic and technical training. In nearly all studies, close cooperation is maintained with industry and trade groups and with private firms that generously provide essential data and make plant facilities available for observation.

The research program of the Fibers and Grains Branch in 1964 was conducted by 25 professional researchers; 16 located in Washington, D.C., and 9 in the following field stations: College Park, Maryland; Stoneville, Mississippi; Clemson, South Carolina; Tucson, Arizona; and Berkeley, California. Research was conducted on various marketing aspects of cotton and cottonseed; wool; food grains, including rice; feed grains; forage; oilseeds; and their products. Research was also conducted for other agencies within the Department relating to the price support programs for cotton and wheat. In fiscal 1964, the Branch devoted over 5 professional man-years to the latter research. In addition, research was conducted in cooperation with the Agricultural Experiment Stations of Indiana, Montana, New Mexico, Nevada, Ohio, Maryland, South Carolina, and Texas; and with Research Triangle Institute of Durham, North Carolina, a private research organization.



In fiscal 1964, the Branch devoted 24.4 man-years to marketing research. Commodity-wise, 2.2 man-years were devoted to sheep and wool; 12.3 to cotton and cottonseed; 8.7 to grains and forage; and 1.2 to oilseeds.

#### PROGRAM OF STATE EXPERIMENT STATIONS

1. Cotton and Cottonseed. Over two-thirds of the projects in cotton marketing research are contributions to regional studies in which Federal agencies are cooperating. Presently the research is directed largely to three main marketing functions. Over two-thirds of the studies are concerned with analysis and evaluation of actual market forces and performance in channels of trade with emphasis on potentials for more efficient marketing systems than now prevail. About 20 percent of the studies are concerned with effects of handling practices for lint and seed cotton on quality factors affecting grades. An equal number of studies emphasize factors affecting costs and operating efficiencies in gin operation and on handling practices of cotton at the gin.

Total research effort on cotton marketing at the nine stations is 10.7 professional man-years.

2. Grain Marketing. A significant portion of the grain marketing research dealing with the economics of marketing grain and grain products is being pursued under regional projects NCM-30, Grain Marketing Institutions and the Structure of Grain Products in the South. Eleven North Central States have participated in the former and nine Southern States in the latter. Federal agencies (ERS, AMS, and FCS) also have been participating in these ambitious undertakings.

Eighteen projects are classified as market structure studies, eleven of which are contributors to regional project NCM-30. The other six studies concerned with market structure differ in emphasis or are being attacked on a more local basis, under the assumption that problems are local in nature or conditions are not typical of the North Central Region. Seventeen projects fall in the broad category of transportation, cost, storage, and intermarket competition. Transportation and storage are closely related because grain must be economically moved into and out of storage. Regional project SM-11 has represented a major attempt to study the transportation and storage problems of grain for a deficit area. The objective of this study was to determine the cost, volume, and direction of flow by different modes of carriage and needed changes in transportation of grain and grain products within, from, and to the South, especially as they are related to temporal and geographic price patterns, utilization, and storage. Until it was closed, a liaison was maintained with regional project NCM-19, "Pricing and Trading Practices for Grain in the North Central Region." SM-11 is being replaced by another regional project entitled "Optimal Adjustments of Southern Grain Marketing Facilities to Present and Future Conditions."

Eight projects concerned with transportation, storage, grain bank operations at country elevators and interregional competition are being conducted by States other than those participating in SM-11. Three studies concerned with management, cost and efficiency of feed manufacturers, dealers, and elevator operators have been conducted. Other studies concerned with hay and processed feed marketing are carried on at six stations, mainly in the Western region. One-half of these studies are contributions to a regional study. Price studies concerned with grain are reported in another section of this report.

A total of 26.2 professional man-years are devoted to grain marketing research reported here.

3. Seeds. Only one station has a project in this commodity area. It investigates the potential for expanding the market for farm seeds. Total research effort on this project is approximately 0.3 man-years.

A total of 37.2 man-years are devoted to fiber and grain research reported under this area.

## PROGRESS--USDA AND COOPERATIVE PROGRAM

### I. Sheep and Wool

#### A. Structures, Practices, and Competition

1. Organization, Operation, and Efficiency of the Marketing System for Raw Wool. The cost of marketing raw wool often amounts to as much as 30 percent of the producer's income from wool. Efforts by growers and marketing agencies to properly adjust their practices and reduce these margins are hampered considerably by a lack of information relating to recent significant changes in the structure, location, and practices of the wool trade. The suddenness and scope of these changes have accentuated the need for an evaluation of the adequacy of the domestic wool marketing system. The study was initiated during the current year. Progress consisted mainly of preparation of schedules for interviews of wool producers, wool pools, warehouses and textile mills. The study is conducted in cooperation with the American Farm Bureau Federation and National Wool Marketing Corporation.

2. Organization, Operation, and Efficiency of Wool Pools. Farmers in the fleece wool areas (outside the Western States and Texas) marketing wool in small quantities may benefit greatly if they market through local pools. They need information on how such pools should be organized and operated as a basis for such action. Data on the organization, marketing policies, services, and practices of local wool pools throughout the United States were analyzed to show the influence of these factors on price determinations, marketing efficiency, and producer incomes. Results indicate that local wool pools have generally increased their members' bargaining power and income. But pools are often poorly organized and managed and have too little knowledge of the

differences in wool quality prices, and mill requirements. Specific recommendations are suggested which, if implemented, will improve pool organization and operation. The study was conducted in cooperation with the Farmer Cooperative Service.

## B. Product Quality

1. Feasibility of Grading, Sorting, Scouring and Baling Wool in Producing Areas. Wool marketing may cost the sheep producer almost one-third of his income from wool. Marketing margins might be lowered considerably if more of the marketing operations were performed in the Western producing area rather than in Eastern markets. Two research areas were developed under this project. Analysis of data for both areas was completed and the results prepared for publication. One area related to the feasibility of grading and sorting wools at local warehouses. Sorting appears feasible only for highly variable lots of wool and for tags. Substantial losses were incurred when graded wool was sorted. The second research area was concerned with developing guidelines regarding the feasibility of baling and scouring grease wool in the producing areas, particularly the 11 Western States and Texas. Baling of grease wool appears desirable by all but the smallest wool warehouses. Various bale dimensions and stacking arrangements are evaluated to achieve maximum use of popular size motor-trailers and rail cars. Scouring wool in the producing area will certainly reduce transportation cost. But, the fact that most of the domestic wool clip may be processed on the worsted system more than offsets this advantage unless the wool is scoured for mill accounts and to their specifications. Findings will be published in early 1965. These studies were conducted in cooperation with the Agricultural Experiment Stations of Texas and Ohio.

## C. Information, Outlook, and Rural Development

1. Influence of Classification and Market Information on Wool Prices. One of the fundamental weaknesses of the present system of marketing domestic wool is the lack of adequate classification and market information services. Research is designed to determine the effects of classification and market information services on wool prices to producers and to ascertain the feasibility of providing such services. Data have been assembled and analysis of price-quality relationship data is underway. Another phase of the analysis indicates little relationship between central market quotations and local prices in the Western States. The results also indicate that price-quality relationships in local markets could be improved by better information on prices and markets utilizing AMS livestock reporters. This study is conducted in cooperation with the New Mexico State University and the U.S. Agricultural Marketing Service.



## II. Cotton and Cottonseed

### A. Structure, Practices, and Competition

1. Pricing Cotton in Relation to Fiber Properties. United States' cotton's competitive position would be enhanced by an appropriate pricing system which would more accurately reflect its true use value. A report to be published in early 1965 supports the preliminary findings reported last year. Continuing checks on the market situation were made during the year to provide a basis for recommendation for incorporation of fineness differentials on loan prices.

2. Marketing and the Use of Cotton Waste. Marketing and processing cotton waste is a multi-million dollar business. Although numerous end products are manufactured from this valuable byproduct of the cotton industry, requiring the services of a wide variety of firms, there is little specific knowledge available on source, quality, and utilization of waste and on marketing and pricing practices. Since initiation of this project in May 1964, plans for the collection of data on market organization and structure and marketing practices and procedures have been finalized. Tentative plans for conducting two succeeding phases of work have also been developed.

3. Cotton Bagging. Improved packaging of other commodities in recent years, and the growing competition from synthetic fibers and foreign cotton with their better package, have focused better attention on the unfavorable aspects of the American cotton bale package. The feasibility of replacing the present jute covering with one made of cotton was investigated. The results indicate that a cotton covering is more satisfactory to shippers and mills but costs about 3 times as much as the jute covering. This study was conducted in cooperation with the U.S. Agricultural Research Service and they prepared a report incorporating their results.

### B. Product Quality

1. Changes in Quality and Value of Cotton Bales and Cotton Samples During Storage. Changes in quality of cotton during storage lower market values and necessitate frequent resampling of bales with attendant increases in cost. In addition, the practice of cutting samples from cotton bales results in contamination of the fiber, and increases the risks of fire damage. These disadvantages could be offset through acceptance of automatic sampling. Information was needed on the extent and nature of quality changes in stored bales, the feasibility of using stored samples for evaluating these quality changes, and the usefulness of automatic samples for determining market value of cotton. This study was undertaken in cooperation with U.S. Agricultural Marketing Service.

2. Economic Evaluation of Cotton Quality. Certain cotton production, harvesting, and ginning practices which appear to lower cost or increase prices to producers result in damage to the fibers, which increases manufacturing costs,

decreases the quality and value of textile products, and impairs the competitive position of U.S. cotton. Measures of the effects of these practices are needed as guides for efficient adjustments in the cotton industry. Recently completed analysis of the combined effects of defoliation and gin cleaning on El Paso cotton shows that premature defoliation was associated with only .2 of a unit lower average micronaire reading; 90 units lower yarn break factor; 6 points lower yarn appearance index; and .35 percentage point more manufacturing waste than the normal or nondefoliated cotton. However, defoliated cotton was 1/32 to 1/16 inch shorter. Minimum cleaning produced somewhat lower grade and market value but longer, more uniform fibers which had substantially lower number of neps in carding and higher yarn break factor than cotton receiving maximum cleaning. Tests on cotton from other areas completed during the past year indicate similar results. Reexamination of length distribution data from previous tests, indicates that the reduction in long fibers resulting from extreme drying and cleaning practices usually is accompanied by changes in the length of cotton in all other categories with, generally, a somewhat less proportionate reduction in medium lengths but a very substantial increase in short lengths. This study is a cooperative undertaking with Clemson Agricultural College and U.S. Agricultural Research Service.

### C. Margin, Cost and Efficiency

1. Charges and Practices in Marketing Cotton. Frequent changes in the costs and organizational structure of the cotton industry require that up-to-date information be available on charges to producers for ginning and selected marketing functions and on trends for related services. In the 1963-64 season the Beltwide charge for saw ginning and wrapping a 500-pound bale of cotton was \$16.80--a decrease of 28 cents per bale from the previous season. Improved turnouts contributed to the lower average charge. A 500-pound bale required 1,388 pounds of handpicked seed cotton, 1,952 pounds of handsnapped, 1,476 pounds of machine-picked, 2,214 pounds of machine-stripped, and 2,389 pounds of machine-scrapped. The proportion of upland cotton harvested by machine increased 2 percent during the 1963-64 season. Beltwide, 51 percent was machine-picked, and 1 percent machine-scrapped for a total of 72 percent mechanically harvested. Charges by public warehouses averaged 74 cents per bale for receiving and 51 cents per bale per month for insured storage in 1963-64, about the same as in the previous season. The study was undertaken in cooperation with U.S. Agricultural Marketing Service.

2. Marketing Margins and Costs for Fibers and Textiles. Information on the competitive position of American cotton and wool; marketing margins and costs for cotton, wool, manmade fibers, and textile products is needed as a basis for appraising the present position of the industry and to indicate means of improvement. Data from a completed study indicate that market outlets for American cotton and wool continue to be adversely affected by increased competition from other fibers. Costs of ginning and merchandising cotton continued to increase to 1963. Margins for wholesale and retail distribution of textile products have increased since 1947, averaging 41 percent of the consumer's dollar in 1962.

3. Cotton Ginning Efficiency and Cost. Additional cleaning equipment in gins necessitated by increased mechanical harvesting, declining volumes in some areas, and rising cost of variable inputs have resulted in a sharp upward movement in average ginning costs and created an urgent need for reliable information designed to increase ginning efficiency in each major production area. Several phases of work were pursued during the past year under this project. Results indicated that substantial savings in power costs could be realized by peaking the efficiency of individual air systems used for materials handling, by rearranging gin machinery to eliminate unnecessary fans, motors, and piping, and properly loading electric motors. Results also indicate that under present market conditions most ginners can profitably reclaim their gin motes. In addition, more efficient use of labor could reduce cost per bale between 13 to 33 cents per bale in the selected areas studied. Work was initiated to determine the economic advisability of increasing ginning capacity by storing seed cotton. Cost data from long staple gins in Arizona and New Mexico were collected to supplement data required for the proposed development of model gins.

4. Cost and Efficiency of Warehousing and Related Services for Cotton. Rising costs at cotton warehouses and increased stocks of Government-owned cotton give added importance to the need for information on the cost of operating cotton warehouses. Research designed to provide this information is underway.

#### D. Information, Outlook, and Rural Development

1. Central Market Quotations for Cotton and Factors Affecting Their Adequacy. Departmental responsibility for providing cotton price information which is adequate for use in cash and futures trading and in the operation of the price support program requires periodic evaluation of the adequacy of the basis for and accuracy of central market quotations.

### III. Grain and Forage

#### A. Structures, Practices, and Competition

1. The Changing Structure and Performance of the Northeastern Grain Markets. The rapid change in the structure of the Northeastern grain markets created serious marketing problems to many agencies engaged in handling, processing, and distributing grains. Forward-looking research is needed to determine trends in grain markets and thereby provide the Northeastern grain industry with basic data to make optimum adjustments to changing conditions. The study is nearing completion and results will be published during early 1965. Research was conducted under cooperative agreement with the Maryland Agricultural Experiment Station.

2. Industry Structure and the Costs of Storing Sorghum Grain in Commercial Elevators. The rapid increase in sorghum grain production during the 1950's and Government programs changed marketing patterns and required additional



storage capacity. Elevator operators and public officials need information relative to efficient methods of maintaining market value of sorghums during storage, and to changing marketing and utilization patterns. Results indicate that receiving costs at elevators for sorghum grain range from 1.8 cents per bushel in large elevators down to .85 cent per bushel in small elevators. Loading out costs are slightly less. Aerations costs range from about .3 cent to about .7 cent per bushel depending on length of time aeration is used; turning costs .5 cent per bushel per turn; fumigation costs, including cost of chemicals, labor and power, range from .15 cent per bushel to about .5 cent, depending on the particular fumigant used and method of application. The study was conducted under contract with Texas A&M University.

## B. Product Quality

1. An Economic Evaluation of Alfalfa Hay Grading. Hay marketing is completely disorganized in the West. Present grades do not reflect all of the attributes important for equitable pricing. Development of new hay grades or tests which include the needed factors is essential to efficient hay marketing. A publication based on the first phase of the study determining the extent of grading for hay will be published during December, 1964. In a second phase, detailed costs of inspection and ways to reduce the time lag between actual inspection and making results available were developed. The study is conducted under a cooperative agreement with the Nevada Agricultural Experiment Station.

## C. Margin, Cost and Efficiency

1. Price Spreads, Margins, and Costs for Grain and Grain Products. Prices of many manufactured agricultural products, particularly bread, continue to rise. Much of this rise is attributed to upward changes in processing and distribution costs. Continuous research is needed to determine the magnitude of these changes and to find means to process and distribute grain products more economically. To date, analysis of price spreads for white bread indicates that prices continued to rise into 1964 to 21.6 cents per 1 pound loaf of white bread up nearly one-half cent from 1963. As in previous years, much of the increase in retail prices is attributed to the rise in the baker-wholesaler gross spread and rise in retailing costs. The farm value of bread (wheat and other farm products) has largely remained unchanged for several years.

Cost and Efficiencies in Bread Distribution. A study is now underway to determine the cost and efficiencies of alternative methods of bread distribution. The study is confined largely to California.

2. Cost of Operating Grain Elevators. Cost of storing and handling grain in country and terminal elevators materially influences the cost of operating price support programs for grain, returns to farmers and elevator operators. Accurate up-to-date information on these costs also is essential for an efficient operation of the price support program. A study is underway involving technical-economic methods of measuring and allocating costs among different functions and enterprises in various grain warehouses.

Cost and Efficiency of Grain Storage and Handling in the Spring Wheat Area.

The elevator industry in the spring wheat area, geared to pre-World War II marketing patterns, was forced to expand rapidly after the war due to a shortened harvest period, increased production, and Government programs. Expansion has not been orderly. Information is needed by elevator management as to the most efficient use of resources, improvements in operating procedures, and the rational allocation of costs among the segments of the enterprise. Two reports, one dealing with elevator costs and their allocation to the segments of the enterprise and the other dealing with trends and prospective developments in the organization and functioning of the grain elevator system will be published. The study is conducted under contract with the Montana Agricultural Experiment Station.

3. Cost and Efficiency in the Operation of Feed Mixing Plants. Mixed feeds production has increased greatly in recent years. At the same time production facilities have been decentralized. Feed mill management needs information on production standards in the various phases of feed mill operations to guide them in reducing costs in old mills and in planning new facilities. Results indicate a small plant, packing 65 tons of feed per 8-hour day, incurs an operating cost of 39.3 cents per ton while a larger plant packing 160 tons per 8-hour day incurs 29.8 cents per ton. When both plants pack 42,000 tons of mixed feeds a year, the larger model has a 20 percent cost advantage. The study on the receiving center also uses two models: One receives 80 tons of ingredients per 8-hour day and the larger receives 200 tons. The 80-ton plant incurs an operating cost of 61 cents per ton while the larger model incurs 46 cents per ton. A cost comparison is made between two basic methods of handling bulk ingredients.

4. Structure and Performance of the Rice Milling Industry. Up-to-date information on milling costs is needed in administering the price support and export subsidy programs for rice. Also, improvement in operating practices and labor utilization is needed for an efficient operation of the rice milling industry. A manuscript is under preparation which indicates differences in labor standards in different rice mills having alternative types of equipment. Also, data on rice milling costs collected during the previous year are being further analyzed to determine the major factors that influence milling costs in various rice mills.

5. Impacts of Grain Banks on Feed Milling and Farming. Little is known about a new merchandising technique in the marketing of feed grains and mixed feeds. This technique, called grain banking, became widespread in recent years in the Midwest. Information of its impact on the operating efficiency of the feed industry is needed to guide farmers and management of the feed mixing plants toward more efficient methods of marketing. Inherent in the system are labor saving features available for both the farmer and the local elevator operator. Firms surveyed indicated an average of almost 40 percent of their total feed output was through the grain bank. Beef cattle, dairy cattle, layer, broiler, and turkey feeders used grain banking facilities. The largest single user of the grain bank was the hog feeder--about 67 percent of

the total feed distributed through the grain bank system. Grain bank services and charges varied greatly averaging \$8.95 for processing a ton of mixed feed.

#### IV. Oilseeds

##### A. Margin, Cost and Efficiency

1. Marketing Margins for Fats and Oils in Selected Consumer Products. The major shift in the utilization of various types of fats and oils in recent years created considerable marketing problems for agencies assembling, processing, and distributing those products. Basic information pertaining to the total production, value and per capita consumption of salad dressing; the production by type of salad dressings and size of consumer containers used; and the consumption of oils, by type, used in the production of salad dressing are being developed. Price spreads on salad dressing are now in the process of preparation. Retail prices are now being analyzed.
2. Labor Utilization in Cottonseed Oil Mills. Labor is the largest item of cost in processing cottonseed. Since trends in wage rates have been moving up for some time a study of labor-saving equipment and operating practices in various cottonseed oil mills provides a valuable guide to processors in improving operating efficiency. The study reveals wide variations in labor use and suggests a considerable amount of potential saving in cost by more efficient utilization of labor particularly in screw press mills. For example, it is estimated that a potential savings of over \$27,000 could be achieved if a mill with a 21,000-ton seasonal crush would use 2 rather than 3 man-hours per ton, a feat accomplished by some of the more efficient mills.

#### PUBLICATIONS

##### Cotton and Cottonseed

- Cable, C. C., Jr., Smith, H. R., and Looney, Z. M., Feb. 1964, Changes in Quality and Value of Cotton Bales and Samples During Storage, MRR 645, pp. 58
- Cable, C. C., Jr., Smith, H. R., and Looney, Z. M., April 1964, Comparison of Mechanically Drawn Samples with Cut Samples for Evaluating Cotton Quality, MRR 654, pp. 28
- Ross, J. E., and Shanklin, E. H., July 1964, Some Effects of Gin Drying and Cleaning of Cotton on Fiber Length Distribution and Yarn Quality, MRR 666 pp. 12



Calkins, E. W. S., Newton, F., and Griffin, A. C., June 1964, Fiber and Spinning Properties of Cotton as Affected by Certain Harvesting and Ginning Practices, Yazoo-Mississippi Delta, 1959-60 (published by AMS) pp. 27

Howell, L. D., Nov. 1964, The American Textile Industry--Competition, Structure, Facilities, Costs, Ag. Econ. Rpt. 58, pp. 146

\_\_\_\_\_, May 1964, Charges for Ginning Cotton, Costs of Selected Services Incident to Marketing, and Related Information, Seasons 1963-64, ERS-2, USDA, pp. 1

Wilmot, C. A., and Alberson, D. M., March 1964, Increasing the Efficiency of Power Used for Materials Handling in Southwestern Cotton Gins, ERS-154, pp. 18

Holder, S. H., and Looney, Z. M., May 1964, Reclaiming and Marketing Cotton Gin Motes, ERS-168, pp. 14

Holder, S. H., and McCaskill, O. L., Oct. 1963, Cost of Electric Power and Fuel for Driers in Cotton Gins, Arkansas and Missouri, ERS-138, pp. 12

Watson, H., Griffin, A. C., and Holder, S. H., Jan. 1964, Power Requirements for High Capacity Cotton Gins in the Yazoo-Mississippi Delta, ARS 42-94, pp. 14

Pritchard, D. L., and Potter, J. R., Jr., May 1964, The Traffic Pattern of Raw Cotton Shipped from Warehouses in the United States, 1961-62, ERS-184, 34 pp.

Ross, J. E., May 1964, Trash as a Factor in Costs and Mill Performance, Speech published in Summary Proceedings, Cotton Marketing Conference-Seminar, National Cotton Council, Hot Springs, Ark.

#### Grain and Forage

Bonnen, C. A., and Cunningham, W. C., April 1964, Selected Operating Costs for Storage of Sorghum Grain, Texas Agrl. Expt. Sta. B-1009, pp. 19

Eiland, J. C., Feb. 1964, Marketing Spreads for White Bread, ERS-158, pp. 15

Eiland, J. C., Sept. 1964, Spread in Farm-Retail Prices of White Bread, Misc. Pub. 969, pp. 7

Fletcher, L. B., Jan. 1964, Market Organization of Grain Industries in the North Central Region, Mo. Agr. Expt. Sta., Res. Bul. 847., pp. 28

Greene, C. H., Jan. 1964, Cost and Efficiency in the Operation of Oregon Commercial Seed Processing Warehouses, Spec. Rpt. 167, Oregon Agrl. Expt. Sta. pp. 47

Vosloh, C. J., Jr., May 1964, Operating Costs in Packing Mixed Feeds--With Emphasis on Labor and Capital, MRR 658, pp. 20

Stahl, W. H., and Farris, W. S., Sept. 1963, Grain Banks in the Midwest, Purdue Univ., Agrl. Expt. Sta., Res. Prog. Rpt. 80, pp. 13

Oilseeds and Peanuts

Smith, T. B., July 1964, Operating Procedures and Labor Utilization in Cottonseed Oil Mills, 1961-62 Season, ERS-179, pp. 27

## AREA 8

### HORTICULTURAL AND SPECIAL CROPS

Problem: The scope of the work includes horticultural and special crops (sugar, tobacco, peanuts, citrus fruits, deciduous fruits, vegetables, potatoes, tree nuts, cut flowers, flowering plants and ornamental nursery products) and related products and services that farmers, marketing firms, and consumers may buy or sell; and the compilation of information, its economic and statistical analyses, and the preparation of reports of research results, conclusions, and recommendations.

Markets and marketing functions and systems are described and evaluated from the standpoint of determining the adjustments in marketing channels, locational patterns, institutional structures, practices, price-making processes, and other conditions that are necessary to facilitate markets and systems of marketing in keeping pace with other segments of our growing economy characterized by rapid technological, political, and social change. Illustrative of subjects studied are: (1) Price and marketing policies and practices of producers, assemblers, processors, retailers and of others handling horticultural and special crops, and factors affecting these policies and practices such as location, size of business, integration, competition, traditional trade practices, and various administrative arrangements; (2) specialized marketing institutions such as commodity exchanges, auctions, buying points; (3) economic interrelationships between agricultural marketing and other industries; (4) economic consequences of major technological and other developments and the resulting changes in marketing these require; (5) impacts of public programs such as price supports, marketing orders, and export subsidies on product prices, markets and marketing practices and efficiency; and (6) effects of governmental regulatory programs such as inspection for wholesomeness, price maintenance, and grades and other quality standards on markets and marketing efficiency.

### USDA AND COOPERATIVE PROGRAM

The Department conducts a continuing program involving a series of studies to show: (1) Detailed analyses of marketing costs and margins in the various stages and channels in handling, processing, transporting, and distributing horticultural and special crops and related products; (2) comparative efficiency and costs of present agencies, organizations, methods, and practices in performing the services involved at each important stage in taking the crop products from farms to final users; and (3) the influences on costs and efficiency of such factors as grades and standards, methods of determining and maintaining product quality, and governmental regulatory and informational programs. On the basis of results of such studies, recommendations are made on possible means of increasing the efficiency of marketing, or increasing



returns to growers, and of providing consumers with the choices they desire.

The USDA scientific effort devoted to this research in Fiscal 1964 amounted to 26.1 professional man-years. The effort was distributed as follows: tobacco 2.9, peanuts 1.2, sugar and sweeteners 2.8, citrus and subtropical fruit 3.0, deciduous fruits and tree nuts 5.0, potatoes 2.5, vegetables 7.6, and flowers, ornamentals and shade trees 1.1 man-years.

Although most of the research is performed by personnel in Washington, D. C., an important part of the work is done by USDA professional staff located at field stations in several States. These agricultural economists work closely with State agricultural experiment stations which also share a part of the expense of the cooperative studies. Also, several studies are carried out jointly with producer groups and other agencies who contribute financially to the research program. These are, namely, the Florists' Telegraph Delivery Association, the Atomic Energy Commission, and the Area Redevelopment Administration.

#### PROGRAM OF STATE EXPERIMENT STATIONS

##### Tobacco

Research projects at State stations cover three functional areas of marketing. These are concerned with various management practices, financial factors, and costs and efficiency in tobacco warehouse operations, structure of the Pennsylvania tobacco industry, operation of the auction market and auction warehouse facilities, and labor requirements in preparation of flue-cured tobacco for market.

A total of 3.1 professional man-years.

##### Sugar

Only one station has a project dealing with sugarcane. This study deals with the hauling of sugarcane by motor truck.

A total of 1.1 professional man-years.

##### Fruits and Vegetables--Cross Commodity

Citrus and Subtropical Fruit. Research on these commodities is carried out by the State agricultural experiment stations located in areas of warm winter climates. The research is not concentrated heavily in any one functional area. One station has a project on marketing practices and prices, another a project on the characteristics of the market and consumer demand, another one on the costs of various methods of harvesting, assembly and packing, and

trends in costs of processing. One station has a project on testing for determining market potential for a new product.

A total of 2.8 professional man-years.

Deciduous Fruits and Tree Nuts. Much of the research at the State agricultural experiment stations on deciduous fruits and tree nuts relates to structure, practice, and competition. This involves a study of marketing practices used by farmers as well as firms in the trade, the interrelationships of new technology such as bulk handling to market organization and market power, trends in the number and size of firms, and the impact of market power technology and trends upon returns to the grower. Tests are conducted on the sales effectiveness of specific merchandising and promotional practices and the influence of packaging and shipping methods on the quality of the product. Some attention is given to the effects of types of advertising upon volume of sales. An important segment of research on these commodities relates to costs and efficiency in firm operations including assembly, processing, wholesaling and retailing. The firm structure is studied by operating segments so as to determine least cost combinations. One station has considerable research on prices and consumer demand but this is reported in another area.

A total of 12.3 professional man-years.

Potatoes. Research at the State agricultural experiment stations is centered largely in Maine, Idaho, and the Red River Valley. Much of it relates to trends in market structure and practices, the extent to which producer and wholesaler practices meet the needs of large-scale buying by retailers, development of suggested organizational structure which will increase marketing efficiency as well as increase returns to growers, and the trends in utilization patterns as between fresh and processed. The largest segment of research relates to costs of assembly, grading, and packaging.

A total of 5.8 professional man-years.

Vegetables. The largest segment of vegetable marketing research at the State agricultural experiment stations falls in the area of structure, practices and competition. This involves finding out where farmers sell their products, in what volume, and at what prices. One station has a project dealing with institutional buyers. This type of information is used as a basis for suggesting improvements in practices and policies. Another important segment is the determining of costs and efficiency in the assembly, processing, packaging, and selling. These studies involve economic-engineering type of studies in the analysis of alternative methods of performing the elemental functions which form the basis of marketing systems. Another important segment is the study of transportation costs and systems and its function in the competitive position of various producing areas.

Merchandising and promotion studies deal with packaging, advertising and store displays, and consumer response.

A total of 14.4 professional man-years.

### Flowers, Ornamentals, and Shade Trees

Research in the horticultural specialties area is quite well divided between flower crops and ornamental and nursery products. Three-fourths of the projects are contributions to regional research studies. Studies on flower crops are dominantly on economic forces affecting marketing florist products in mass outlets and the effects of this development on the market structure of the industry. Of next importance are studies of merchandising practices and specific methods of processing, handling and selling flowers in retail stores. Other studies include general descriptions of retail operations and costs and returns in grading cut flowers.

Research on ornamentals and nursery is dominantly concerned with procurement, handling and distribution practices of retail nurserymen, and factors affecting trends in consumer use of various nursery crops and marketing services provided by nurserymen. Specific attention is being given to an evaluation of methods of disseminating information on plant material selections and use. Three studies are concerned with various aspects of industry structure and practices in selected areas.

A total of 14.4 professional man-years.

## PROGRESS--USDA AND COOPERATIVE PROGRAMS

### I. Tobacco

#### A. Structure, Practices and Competition

1. A comparative analysis of the Canadian tobacco auction system and the Kentucky auction system reveals wide variations in operating costs. The costs of operating the Canadian auction warehouses in 1963 averaged \$5.83 per thousand pounds of tobacco sold. Similar costs for operating the Kentucky auction warehouses in 1959 averaged about \$20.00 per thousand pounds of tobacco sold. The Canadian auction system uses only 3 warehouses, owned by the Ontario Flue-Cured Tobacco Growers Marketing Board, to market the entire flue-cured production. The volume of tobacco sold through each warehouse averages over one-half million pounds of tobacco per day. This volume makes automation and volume handling possible on many operations. In contrast to the Canadian auction, warehouses in Kentucky average less than 50 thousand pounds of tobacco per day.



## B. Product Quality

1. A study of the tobacco quality literature reveals that this area of research is being greatly enlarged due to the impact of the smoking and health report. This Department has contracted for additional chemical studies on the neutral resins of tobacco. A report from the Eastern Utilization Laboratory indicates that certain chemically isolated aromatic factions correlate with the results of smoking test panels. With a view to a practical market sampling and quality testing, the measurement of total alkaloid content appears to be the most feasible. Along with the chemical tests, measurements for physical data are important components of the tobacco use value. The two most important physical variables are moisture content and filling power with an unknown degree of interaction to be determined. Future progress will explore the feasibility of correlating sample data for these variables with value.

## C. Margins, Costs and Efficiency

1. Manufacturing margins range widened as a result of technological and other advances in the tobacco manufacturing industry. These advances have had a definite and pronounced effect on the domestic requirements and demand for cigar and cigarette tobaccos. The introduction of small sized cigars and the use of sheet or homogenized binder has reduced the quantity of tobacco needed to produce a given number of cigars. The shift to homogenized binder and the increased production of "short-filler" cigars has made possible the mechanization of more manufacturing operations of the cigar industry. The share of consumer expenditures for cigarettes received by the growers in 1962 was 4 percent lower than it was in 1946, and the tax share was 5 percent lower. The most important reason for the decline in the growers' share was the introduction of filter-tip cigarettes and the development of the homogenized tobacco sheet, both of which reduce the leaf tobacco requirements in manufactured cigarettes. This in turn tended to widen the manufacturing margin.

2. A new package for selling flue-cured tobacco has been market tested. Key features of the new method are uses of 38-by-38-inch and 30-by-30-inch wooden frames during packing and knitted paper to wrap the tobacco. Use of the frame results in square packages of loose leaves. Tobacco is wrapped in paper sheet when the frame is removed. Paper covering, which replaces customary burlap or cotton, stays with the tobacco all the way to the processing plant.

## II. Peanuts

### A. Margins, Costs and Efficiency

1. By establishing the prices which shellers must pay for the various kernel grades of farmers stock peanuts, the peanut price support program

can influence sheller decisions as to the quality of farmers stock peanuts to market through commercial trade channels. A linear programming analysis of Virginia type peanut sheller responses to the pricing system shows that the most profitable qualities of farmers stock peanuts for shellers, under current support programs, are those containing high percentages of fancy and low quality peanuts. This finding bears out a common complaint of shellers that too few peanuts of fancy quality are produced. Also, the support price differential between sound mature kernels and other kernels appears to be too large to induce shellers to move the maximum possible quantity of high quality shelled peanuts through commercial channels. Expanding the programming analysis to include supply restraint for farmers stock peanuts and demand restraints for shelled peanuts will provide estimates of the total quantities and qualities of farmers stock peanuts that should move through commercial channels under various assumed conditions.

### III. Sugar and Sweeteners

#### A. Structure, Practices and Competition

1. A study will be conducted to evaluate production and export potentials in various areas of the world in relation to the probable needs of the United States sugar market. The recent world shortage of sugar, together with the rapid use in world consumption since the end of World War II, have caused concern about the sources of supply of raw sugar for importation into the United States in future years. While the capacity to increase sugar production throughout the world appears very great, the problem is complicated by various systems of trade preference which channel exports into politically determined patterns.

2. Molasses in each of its major uses is subject to effective competition from alternate raw materials. In livestock feed other materials such as milo, corn, bran and soybean flour may be substituted for molasses. In some chemical uses, petroleum gases such as ethylene and ethyl sulfate can be used in the production of various types of alcohols, while in citric acid production plans have been announced to use dextrose as a raw material in place of molasses. This substitution limits the price response of molasses to smaller supplies. However, no suitable substitutes for molasses have been determined to be acceptable in yeast production. Recent price increases in molasses have generated great production efficiency to offset these price changes.

#### B. Margins, Costs and Efficiency

1. While sugar prices prior to 1963 had not been rising as fast as factor costs incurred in the production and processing of sugar beets in the "Eastern" region (Michigan and Ohio), marketing advantages, as compared with producers in other areas are such that production in these States is likely to continue and probably increase somewhat. The total output of sugar in the region is much smaller than sugar consumption in nearby areas.

As a result, transportation costs are minor and net returns per pound of sugar higher for producers in the "Eastern" region than for competing suppliers who must ship sugar longer distances.

2. Unusual movements of sugar prices in 1963 and 1964 together with an increase in beet sugar suppliers relative to total marketings have affected both the prices received by farmers for sugar beets and sugarcane and their share of the market price of sugar. Preliminary results of a study of these shifts and their relation to the structure of the United States sugar industry indicates that their effect varies significantly among major producing areas, and probably among growers within an area.

#### IV. Fruits and Vegetables--Cross Commodity

##### A. Structure, Practices and Competition

1. The competitive position of the Western vegetable processing industry is affected considerably by competition from areas nearer major markets and consuming centers. A comprehensive analysis of costs of producing, processing and the interregional competition in marketing asparagus is underway. A detailed analysis of labor utilization in asparagus canning operations shows possible savings of from \$16 to \$40 per hour of plant operation. Studies of tomato canning operations were initiated in August 1964.

2. Direct purchasing of fresh fruits and vegetables by retail chains has affected the structure of the wholesale market for fresh produce. A final report summarizing changes in the structure of 52 wholesale produce markets shows that direct purchases from shipping points by chains and affiliated groups increased from 12 percent of total market receipts in 1936 to 26 percent in 1958. During this time the number of produce wholesalers decreased by 15 percent.

A study of further changes in the structure, organization and practices since 1958 in the Philadelphia wholesale produce market is to be made this year giving particular attention to changes in adjusting to the new food center.

3. Marketing "pink" tomatoes is having a significant effect on marketing practices for tomatoes. A survey of 46 handlers of tomatoes in 27 receiving markets found that about one-half regarded the present system of grading vine-ripened tomatoes as inadequate. A study of the demand and substitution relationships for hothouse, vine-ripened and mature green tomatoes found the demand for all three types to be elastic, with hothouse tomatoes being the most elastic and mature green tomatoes the least elastic.

4. This project, which has been completed, describes and evaluates the pecan industry, including market organization, trade channels, buying



and selling practices, and methods of establishing prices. A survey of pecan shellers disclosed there were approximately 80 firms throughout the South and in St. Louis, Chicago, and Pittsburgh. Eight of the largest firms accounted for 48 percent of industry sales; 37 firms accounted for more than 90 percent of total industry sales. During 1961 the industry as a whole operated at only 35 percent of capacity--large firms operated at 60 percent, and small firms (mostly part-time businesses) operated at only 10 percent of capacity. Pecan growers were interviewed in six States--Arkansas, Florida, Georgia, Mississippi, New Mexico, and South Carolina. The total of 576 growers owned 370,000 pecan trees, or 13 percent of the trees listed in the 1959 Census of Agriculture. These growers planned to plant 38,000 more trees which would result in a 9 percent increase in the number of trees on the farms surveyed. Total sales of pecan trees by 49 nurseries increased from 370,200 in 1958-59 to 748,496 in 1961-62. Nurserymen expected further increases in sales through 1965. The pecan nursery industry is shifting to the West, where insect and disease problems are less than in the Southeast.

5. Technical and economic feasibility research into new methods of marketing peaches and nectarines was completed. Laboratory tests, trial shipments, and other quality evaluations showed that the quality of fruit during and after shipment was generally better with the tight-fill pack than with conventional place-pack methods. In addition, when compared with conventional place-pack methods, cost savings with the tight-fill pack could reduce substantially the level of labor and materials expense. Potential cost savings range between 18 and 25 cents per Los Angeles lug equivalent, depending on the size of plant and length of season considered. When these estimates are applied to the current volume of fresh peach and nectarine shipments, total annual cost savings to the California growers and shippers could range between \$3 and \$4 million.

6. Red tart cherry growers and processors have faced large variations in total production. This variation has caused difficult problems in price negotiations between growers and processors. Analyses of factors affecting demand and price of cherries have been of assistance to the industry. This project is being terminated with the completion of analyses underway.

7. The Lower Rio Grande Valley fruit and vegetable market is being studied. Particular attention has been given to prices received by growers for tomatoes and citrus. The Valley tomato market appears to operate in a highly competitive manner. As a result of this project there is a better understanding of the relations between grower and f.o.b. prices and of marketing margins at shipping point and costs of assembling, handling, and packing. Growers seem willing to do more culling of tomatoes in the field. Similar analyses of prices are underway for citrus, carrots, and onions.

8. Changes in the structure of California fruit and vegetable markets are affected by transportation methods. A study of agricultural exemption, competition, and efficiency in the motor carrier industry disclosed that fruits and vegetables are the most important out-flow of exempt commodities

originating in California. They accounted for 33 percent of the 1961 tonnage of agricultural commodities transported across the California border and for 45 percent of the total ton miles. Trucks hauled about 30 percent of outbound fruit and vegetable shipments. Further research is being done on the probable effects of two alternative transportation policies--the elimination of agricultural exemption, or the extension of agricultural exemption to other modes of transportation.

9. The market feasibility of radiation pasteurization of fruits and vegetables is being evaluated for the Atomic Energy Commission as a part of the "Atoms for Peace" effort. A survey of shippers and wholesalers suggested that successful market introduction of radiation-pasteurized fruits and vegetables would depend on an effective public education program. Also, they estimated that they could afford to pay one-fourth of a cent per pound for radiation pasteurization except for strawberries where they could pay 1.75 cents per pound. An economic evaluation of radiation pasteurization for strawberries indicates that reductions in losses at current price levels should exceed estimated costs for radiation pasteurization. Sufficient technological data were not available for an evaluation for grapes and peaches.

10. Data for a study of the structure of the Red River potato market are being analyzed. Inspection data have been obtained from the Red River Valley Growers Association and from 105 marketing firms. Building and machinery costs have been developed for 5 plants with different packing and storage capacities. The analyses will continue in F.Y. 1965 and projections will be made of number and sizes of firms needed in the future to handle potatoes grown in the Red River Valley.

11. Any attempt at a revenue maximizing program for the citrus industry requires a precise knowledge of the demand functions for each component of the total citrus market. Data concerned with the determination of an aggregate demand function for frozen orange concentrate, the degree of substitution among 3 major classes of orange concentrate and the position of orange concentrate in relation to other concentrated, canned and chilled citrus juices are being analyzed.

12. The U. S. season average price of canning and freezing apples can be estimated by using data which are available early in the marketing season. Ninety percent of the variations in apple prices can be explained by the crop estimate, processed stocks, farm price of fresh apples, and a trend variable. Detailed results of this study were reported last year. This project has been discontinued.

13. A study of market orders for fruits, vegetables and potatoes has indicated that quality regulations under potato marketing order programs have enabled producers to increase their returns. An analysis of prices received by market order and non-market order areas before and after the adoption of the programs indicate that prices received by producers in market order

areas have generally increased relative to prices received by growers in the non-market order areas. This price increase occurred in spite of large production increases in market order areas and a general production decline in non-market order areas. During F.Y. 1965 further analyses will be made of potato marketing orders and the affects of a rapidly growing processing industry on the effectiveness of potato market orders. An additional study of the tomato market order in Florida is underway. Industry discussion of the merits of reinstating the order called attention to the need for evaluation and analysis of tomato growers and handlers interpretations of the benefits of specific provisions of the order which was suspended, with particular emphasis on its effect on grower returns.

14. Costs of packing and storing Michigan apples are being affected by changes in containers and in packing operations and particularly so with the increase in controlled atmosphere storage. In addition, there are 55 percent fewer apple packinghouses than there was in 1955. With this decrease in number there has been an increase in average size. Handling methods and packaging for Michigan apples also have changed. Over 70 percent of the Michigan apple crop is handled in bulk containers and about two-thirds are packed and shipped in polyethylene bags. Detailed studies of packing costs continue.

#### B. Margins, Costs and Efficiency

1. Data for calculating marketing margins are maintained on a continuing basis for specific fresh fruits and vegetables sold in selected markets.

For 1963, the cost of marketing these commodities averaged 63 percent of their retail prices. This was one percentage point higher than the average for the period 1956-62. The retail spread in 1963 averaged 42 percent compared with 39 percent in the period 1956-62. The shipping-point to retail spread decreased from 23 percent during 1956-62 to 21 percent in 1963. The grower-packer share dropped from 38 percent in 1956-62 to 37 percent in 1963.

Preliminary data for 1964 indicate an increase in the retail spread for vegetables to about 50 percent of the retail price, up from 46 percent in 1963. This increase was at the expense of the shipping-point to retail spread, with the grower-packer share remaining unchanged.

#### C. Information, Outlook and Rural Development

1. Additional economic information is needed concerning the feasibility of fruit and vegetable canning and freezing in the South. Growers, public officials, processors and potential investors need this information to assist in evaluating alternative resource uses in efforts to stimulate economic development. A study of the extent to which existing capacity in processing plants is being utilized is underway. The relative importance of vegetable production is being studied. Particular attention is given to showing changes in production by commodity and county. The feasibility studies of locating vegetable processing plants in northeastern North Carolina and the



bootheel area of Missouri are underway with funds from the Area Redevelopment Administration, U. S. Department of Commerce.

## V. Flowers, Ornamentals, and Shade Trees

### A. Structure, Practices and Competition

1. A study to analyze the economics of marketing floral products has disclosed that the florist industry and related services accounts for approximately \$1.2 billion annually. According to census data the farm value of floral products increased more than 50 percent between 1949 and 1959 without any appreciable increase in wholesale prices or numbers of producing units. Personal interview surveys of retail florists in 4 Iowa cities reveal that 89 percent of the florists belonged to a wire service in 1964. Approximately 14 percent of their sales were wire sales, (both incoming and outgoing). Of the 86 percent of the sales that were not wire sales, 60 percent were made over the telephone. Florists did not have serious credit or financing problems, but most of them experienced occasional cash "squeezes" because of slow bill-collection procedures.

## PUBLICATIONS--USDA AND COOPERATIVE PROGRAMS

### Tobacco

Cockroft, Lindon U. and Brown, J. W. H. September 1964. Developing and market testing--an improved looseleaf tobacco package. ERS-189. pp. 13.

### Peanuts

Farnworth, Virginia M. December 1963. Prices, marketing margins, and uses of peanuts in peanut butter. MRR-624. pp. 25.

### Sugar and Sweeteners

Ballinger, Roy A. and Larkin, L. C. January 1964. Sweeteners used by food processing industries. AER-48. pp. 22.

### Citrus and Subtropical Fruits

Manley, W. T. and Chapman, W. Fred, Jr. October 1963. Competitive practices in marketing Florida and Texas fresh grapefruit. MRR-629. pp. 29.

Edman, Victor G. February 1964. Some economic aspects of orange processing. ERS-157. pp. 5.

Deciduous Fruits and Tree Nuts

- Powell, Jules V. October 1963. The pecan nursery industry--structure and economic aspects. AER-44. pp. 21.
- Dennis, Carleton C. December 1963. Long-run equilibrium in tart cherry production. Mich. State Univ. Technical Bulletin 291. pp. 32.
- Dennis, Carleton C. March 1964. A projection to 1980: Long-run tart cherry pricing. Article in Michigan Farm Economics published by Department of Agricultural Economics, Michigan State University. No. 254. pp. 4.
- Reed, Robert H., Mitchell, F. Gordon, Gentry, Joe P., Guillou, Rene Gerdt, Marvin H., Bilbo, Bill C., and Dawson, Robert H. March 1964. Technical and economic evaluation of new and conventional methods of packing fresh peaches and nectarines. I. Technological feasibility of tight-fill peach packing. II. Cost aspects of new and existing methods of packing peaches and nectarines. Giannini Foundation Research Report in cooperation with ERS. Agri. Econ. Inf. Series 64-1. pp. 72.
- Jamison, John A. April 1964. The California fresh deciduous fruit industry: Structure, organization, and practices. California Agricultural Experiment Station in cooperation with ERS. Giannini Foundation Research Report 275. pp. 169.
- Dennis, Carleton C., Dominick, B. A., and Kelly, B. W. May 1964. The tart cherry industry: Production costs. ERS in cooperation with Michigan State University, Pennsylvania State University, and Cornell University. ERS-171. pp. 24.
- Oldenstadt, Dennis L. June 1964. Economic relationships in red tart cherry marketing, 1947-1963. Michigan State University, Department of Agricultural Economics in cooperation with ERS. Agri. Econ. 971. pp. 51.

Vegetables

- Manley, William T. and Godwin, Marshall R. November 1963. Marketing Florida vine-ripened tomatoes--an appraisal by terminal receivers. Florida Experiment Station Circular S-147. pp. 23.
- Podany, Joseph C., Farrish, Raymond O. P., and Bohall, Robert W. November 1963. Packing mature green tomatoes: Quality, costs and margins in the Lower Rio Grande Valley of Texas. MRR-635. pp. 28.
- Chapman, W. Fred Jr., Brooks, Thurston L., and Ford, Kenneth E. July 1964. Vegetable production density--Alabama. Georgia Agricultural Experiment Station in cooperation with ERS. Mimeo Series N.S. 198. pp. 27.

Chapman, W. Fred, Jr., Brooks, Thurston L., and Ford, Kenneth E. July 1964. Vegetable production density--South Carolina. Georgia Agricultural Experiment Station in cooperation with ERS. Mimeo Series N.S. 204. pp. 26.

Cross Commodities

Powell, Jules V. November 1963. Trends in marketing fruits and vegetables. ERS-148. pp. 14.

Edman, Victor G. February 1964. Prices and price spreads for fresh fruits and vegetables in selected markets, 1956-1962. Stat. Bull. 340. pp. 139.

Pittman, Jerold F. and Chapman, W. Fred, Jr. February 1964. The organization of the wholesale fruit and vegetable markets in the South--Atlanta, Georgia. South Carolina Agricultural Experiment Station in cooperation with ERS. Agri. Econ. Mimeo 249. pp. 40.

Pittman, Jerold F. and Chapman, W. Fred, Jr. February 1964. The organization of the wholesale fruit and vegetable markets in the South--Raleigh and Winston-Salem, North Carolina. South Carolina Agricultural Experiment Station in cooperation with ERS. Agri. Econ. Mimeo 250. pp. 47.

Pittman, Jerold F. and Chapman, W. Fred, Jr. February 1964. The organization of the wholesale fruit and vegetable markets in the South--Columbia and Greenville, South Carolina. South Carolina Agricultural Experiment Station in cooperation with ERS. Agri. Econ. Mimeo 251. pp. 40.

Hanes, John K. March 1964. The organization of the wholesale fruit and vegetable market in Minneapolis-St. Paul and Duluth-Superior. MRR-647. pp. 45.

Manchester, Alden C. April 1964. The structure of wholesale produce markets. AER-45. pp. 136.

Manchester, Alden C. July 1964. The organization of wholesale fruit and vegetable markets in Chicago, Lincoln, Los Angeles, Louisville, Milwaukee, New Orleans, Oklahoma City, Omaha, San Francisco-Oakland, Tulsa, and Wichita. ERS-163. pp. 128.



Line Project Check List -- Reporting Year October 1, 1963, through September 30, 1964

Work and project number	Work and line project titles	Work locations during past year	Line project incl. in	
			Summary of progress (Yes-No)	Area and subheading
ME 1	Market structure and costs in the marketing of farm products			
ME 1-5	Extent and effects of labor practices and provisions on the costs, adequacy, and structure of agricultural marketing	Washington, D. C.	Yes	1-A-1
ME 1-6 (Rev.)	Role of agricultural marketing and other firms in supplying additional employment and higher incomes for residents of low-income farm areas	Washington, D. C.	Yes	1-B-1
ME 1-7 (Rev.)	Patterns of growth and change in the structure of agricultural marketing and supply industries and their probable economic consequences	Washington, D. C.	Yes	1-A-2
ME 1-11	Extent and effects of advertising and promotion on the costs, adequacy, and structure of agricultural marketing	Washington, D. C.	No	
ME 1-12 (Rev.)	Marketing situation and outlook reports	Washington, D. C.	Yes	1-B-2
ME 1-13 (Rev.)	The development, maintenance, and analysis of farm-to-retail price spreads, the marketing bill, and other statistics on entire marketing process	Washington, D. C.	Yes	1-C-1
ME 1-14	Appraisal of uses made of and needs for marketing information	Washington, D. C. Columbia, Mo. Manhattan, Kansas	Yes	1-B-3
ME 1-15 (Rev.)	Providing statistical and economic information relating to the marketing of agricultural products	Washington, D. C.	Yes	1-B-4
ME 1-16 (Rev.)	Measurement aggregate economic relations in marketing farm food products	Ames, Iowa	Yes	1-C-2
ME 1-18	Long-term outlook for marketing Western agricultural products	Berkeley, Calif.	Yes	1-B-5
ME 1-19	Pricing practices of food firms of selected products	Washington, D. C.	Yes	1-A-3
ME 1-21	The effect of Federal regulatory activities on agricultural marketing and processing industries	Lafayette, Ind.	Yes	1-A-4
ME 1-22	Economic impact of innovations in marketing technology <u>1/</u>	Washington, D. C.	No	
ME 1-23	Long-term outlook for industries assembling and processing agricultural products in the Pacific Northwest	Corvallis, Ore.	Yes	1-B-6
ME 2	Economics of marketing farm animals and animal products			
ME 2-1	Evaluation of present and alternative methods of establishing quotations and reporting prices for eggs	Washington, D. C.	Yes	6-V-A-1

1/ Discontinued during reporting year.

-Continued

Line Project Check List -- Reporting Year October 1, 1963, through September 30, 1964--Continued

Work and project number	Work and line project titles	Work locations during past year	Line project incl. in	
			Summary of progress (Yes-No)	Area and subheading
ME 2-4 (Rev.)	Costs and margins of marketing livestock and meats and meat products	Washington, D. C.	Yes	6-IV-8-1
ME 2-7 (Rev.)	Economic requirements for development of a commercial egg industry in the South <u>1/</u>	Washington, D. C. Athens, Ga.	Yes	6-V-C-1
ME 2-8 (Rev.)	Characteristics and impact of retail price wars in city milk markets	Washington, D. C.	Yes	6-I-A-1
ME 2-10	Commercial hatchery costs, operations, and trends <u>1/</u>	Washington, D. C.	Yes	6-V-C-2
ME 2-12	Costs and economies of scale in assembling and processing turkeys	Washington, D. C.	Yes	6-V-C-3
ME 2-13	Improving the efficiency of poultry marketing in New England <u>1/</u>	Washington, D. C. Durham, N. H.	Yes	6-V-C-4
ME 2-14	Marketing Economics Division cooperation on southern regional poultry marketing research (SM-26) "The marketing structure for broilers in the South and an analysis of the impact of a national marketing order upon its economic organization and efficiency"	Washington, D. C.	No	
ME 2-15	Marketing Economics Division cooperation in north central regional poultry marketing research: (NCM-31) "Coordinated egg production marketing programs and new marketing technology" <u>1/</u>	Washington, D. C.	No	
ME 2-21	An appraisal of pooling in relation to changing supply and demand conditions in fluid milk markets <u>1/</u>	Washington, D. C.	No	
ME 2-26	Marketing Economics Division cooperation in northeastern regional poultry marketing research: (NEM-21) "Effect of marketing changes upon marketing costs and upon demand and consumption of poultry meat"	Washington, D. C.	No	
ME 2-29	Establishing guides for efficient organization of the dairy industry under changing conditions in the South <u>1/</u>	Experiment, Ga.	Yes	6-I-B-2
ME 2-30	The effects of live animal and carcass shrinkage on pricing cattle and hogs <u>1/</u>	Washington, D. C.	Yes	6-II-A-1
ME 2-31	An analysis of livestock and meat movements in the southern region <u>1/</u>	Washington, D. C. Raleigh, N. C.	No	
ME 2-32	Economic analysis of competitive relationships between livestock markets and marketing channels in the West (WM-37, WM-39) <u>1/</u>	Denver, Colorado 11 Western States Texas	Yes	6-IV-A-2
ME 2-33	Research for improved live hog and carcass pricing and grading <u>1/</u>	Washington, D. C.	Yes	6-III-A-1
ME 2-35	Factors affecting efficiency of marketing livestock and meats in the Northeast (NEM-7) <u>1/</u>	Washington, D. C.	No	

-Continued

1/ Discontinued during reporting year.

Line Project Check List -- Reporting Year October 1, 1963, through September 30, 1964--Continued

Work and project number	Work and line project titles	Work locations during past year	Line project incl. in	
			Summary of progress: (Yes-No)	Area and subheading
ME 2-38	An economic analysis of methods of determining protein and solids-not-fat content as a basis for purchasing milk	Davis, Calif. Washington, D. C.	No	
ME 2-39	An evaluation of the competitive position and potential of the Texas-Oklahoma area in the marketing and distribution of livestock and meat <u>1/</u>	Texas and Oklahoma	Yes	6-IV-A-1
ME 2-41	Adjustments in livestock marketing in the north central region to changing patterns of production and consumption (NCM-25)	Ames, Iowa St. Paul, Minn.	No	
ME 2-42	Flexibility in dairy products manufacturing plants	Washington, D. C.	Yes	6-1-A-2
ME 2-43	Procurement policies and practices of large-volume distributors of eggs	Washington, D. C. University Park, Pa. Columbus, Ohio	Yes	6-V-A-2
ME 2-45	A study of the capacity and flexibility of facilities in milk manufacturing plants	St. Paul, Minn.	Yes	6-1-B-3
ME 2-46	Economics of long distance movement of bulk milk <u>1/</u>	Washington, D. C.	Yes	6-I-A-3,4
ME 2-47	Marketing margins for fluid milk	Washington, D. C.	No	
ME 2-48	Changing market structure and organization of midwest dairy industry	Washington, D. C. Urbana, Ill.	Yes	6-I-A-2
ME 2-49	Procedures, marketing costs, and effects on marketing of maintenance of egg quality from laying house to consumer	Washington, D. C.	Yes	6-V-B-1
ME 2-50	Pricing and marketing milk used for other than fluid purposes in fluid milk markets	Washington, D. C.	No	
ME 2-51	Bibliography of selected subjects in marketing of livestock, meat, and meat products <u>1/</u>	Washington, D. C.	No	
ME 2-52	Market structure and pricing in the livestock industry	Washington, D. C.	Yes	6-IV-A-3
ME 2-53	Information systems for managerial decision-making in fluid milk plants	Washington, D. C. Lafayette, Ind.	Yes	6-I-A-5
ME 2-54	Cost efficiency studies in marketing livestock meats and meat products	Washington, D. C.	Yes	6-IV-B-1,2
ME 2-55	Determining costs, margins and trends in the poultry and egg industries	Washington, D. C.	Yes	6-V-C-5
ME 2-56	Quarterly measurement and analysis of costs, margins and efficiency for 70 selected fluid milk processing and distributing plants	Washington, D. C. Memphis, Tenn.	Yes	6-I-B-1
ME 2-57	Efficiency in managing the total milk supplies in fluid milk markets <u>2/</u>	Washington, D. C.	Yes	6-1-B-4

1/ Discontinued during reporting year.

2/ Initiated during reporting year.

-Continued



Line Project Check List -- Reporting Year October 1, 1963, through September 30, 1964--Continued

Work and project number	Work and line project titles	Work locations during past year	Line project incl. in	
			Summary of progress: (Yes-No)	Area and subheading
ME 2-58	Evaluation of existing and proposed programs of wholesale beef price reporting in southern United States <u>2/</u>	Washington, D. C. College Station, Texas	No	
ME 2-59	Optimum location of livestock and meat marketing facilities in the southern region <u>2/</u>	Washington, D. C. Raleigh, N. C.	No	
ME 2-60	The impact of changing market structure upon the competitive position of the dairy industry in the South <u>2/</u>	Washington, D. C.	Yes	6-I-B-2
ME 2-62	Livestock marketing efficiency in the West <u>2/</u>	Washington, D. C. Denver, Colo.	Yes	6-IV-A-2
ME 3	Economics of marketing farm crops			
ME 3-4	Margins and costs for tobacco leaf and tobacco products	Washington, D. C.	Yes	8-I-C-1
ME 3-8 (Rev.)	Economic factors in organization and location of western fruit and vegetable freezing plants	Berkeley, Calif.	Yes	8-IV-A-1
ME 3-22	Costs and efficiency of looseleaf tobacco auctions	Lexington, Ky.	Yes	8-I-A-1
ME 3-24	The organization, costs and efficiency of tobacco redrying plants	Washington, D. C.	Yes	8-I-C-2
ME 3-30 (Rev.)	Changes in structure of wholesale fruit and vegetable markets	Washington, D. C.	Yes	8-IV-A-2
ME 3-40	Impact of vine-ripened (pink) tomato production on Florida tomato market	Gainesville, Fla.	Yes	8-IV-A-3
ME 3-50	Market structure and practices of the pecan industry <u>1/</u>	Washington, D. C.	Yes	8-IV-A-4
ME 3-53	The impact of technological changes on the structure and organization of the California deciduous fruit industry	Berkeley, Calif.	Yes	8-IV-A-5
ME 3-54	An economic evaluation of processing as a market outlet for vegetables in the Southeast	Gainesville, Fla.	Yes	8-IV-C-1
ME 3-59	"Eastern" beet sugar marketing problems	Washington, D. C.	Yes	8-III-B-1
ME 3-62	Costs and margins in marketing sugar as affected by changing practices	Washington, D. C.	Yes	8-III-B-2
ME 3-66	Costs, prices, and competition in the red tart cherry industry	East Lansing, Mich.	Yes	8-IV-A-6
ME 3-67	Structure and performance of the Lower Rio Grande Valley fruit and vegetable industry	Washington, D. C.	Yes	8-IV-A-7
ME 3-72	Changes in the structure and performance of the California fruit and vegetable industry	Davis, Calif.	Yes	8-IV-A-8
ME 3-74	Feasibility of marketing radiation pasteurized fresh strawberries, peaches, citrus, grapes, and tomatoes <u>1/</u>	Washington, D. C.	Yes	8-IV-A-9

1/ Discontinued during reporting year.

2/ Initiated during reporting year.

-Continued

Line Project Check List -- Reporting Year October 1, 1963, through September 30, 1964--Continued

Work and project number	Work and line project titles	Work locations during past year	Line project incl. in	
			Summary of progress (Yes-No)	Area and subheading
ME 3-75	Economic analysis of the structure and performance of the Red River Valley potato market	St. Paul, Minn.	Yes	8-IV-A-10
ME 3-76	Competitive relationships in marketing citrus products	Gainesville, Fla.	Yes	8-IV-A-11
ME 3-77	Study of Canadian tobacco auctions	Guelph, Ontario, Canada	Yes	8-I-A-1
ME 3-81	Economic evaluation of the commercial utilization pattern for peanuts at the sheller level	Washington, D. C. Raleigh, N. C.	Yes	8-II-A-1
ME 3-82	Tobacco quality and pricing systems	Washington, D. C.	Yes	8-I-B-1
ME 3-86	An analysis of intra-seasonal variation in apple prices <u>1/</u>	East Lansing, Mich.	Yes	8-IV-A-12
ME 3-88	An economic analysis of market orders for fruits, vegetables, and potatoes	Washington, D. C. Gainesville, Fla.	Yes	8-IV-A-13
ME 3-90	Prices and margins in marketing fruits and vegetables	Washington, D. C.	Yes	8-IV-B-1
ME 3-91	Marketing industrial molasses	Washington, D. C.	Yes	8-III-A-2
ME 3-92	Economics of marketing sugar	Washington, D. C.	Yes	8-III-A-1
ME 3-93	Costs of packing and storage of Michigan apples	East Lansing, Mich.	Yes	8-IV-A-14
ME 3-94	Economics of marketing floricultural products <u>2/</u>	Washington, D. C.	Yes	8-V-A-1
ME 4	Economics of new, expanded, and alternative uses of farm products			
ME 4-2 (Rev.)	Market potential for super-concentrated (7-fold) fruit juices	Washington, D. C.	No	
ME 4-4	An economic appraisal of the effects of new product technology in the form of convenience foods on food prices at various levels of distribution <u>1/</u>	Washington, D. C.	Yes	2-J-1
ME 4-6 (Rev.)	Market potential investigations for products from new crops for industrial, feed, food, or pharmaceutical use	Washington, D. C.	Yes	2-J-2
ME 4-8	Economic effects of nonscourable foreign materials in domestic wool on present and potential markets <u>1/</u>	Washington, D. C.	No	
ME 4-10	Market potentials for fats and oils and fatty acids in selected industrial use markets <u>1/</u>	Washington, D. C.	Yes	2-E-1 2-G-2
ME 4-12	Market potentials for materials of agricultural origin in adhesives <u>1/</u>	Washington, D. C.	Yes	2-F-2
ME 4-13	Market potentials for frozen bakery products	Albany, Calif.	Yes	2-F-5

1/ Discontinued during reporting year.

2/ Initiated during reporting year.

-Continued

Line Project Check List -- Reporting Year October 1, 1963, through September 30, 1964--Continued

Work and project number	Work and line project titles	Work locations during past year	Line project incl. in	
			Summary of progress (Yes-No)	Area and subheading
ME 4-15	Market potential for bulgur (parboiled wheat), unseasoned as a pilaf <u>1/</u>	Washington, D. C.	No	
ME 4-16	Market potentials of unextracted soybean meal in poultry feeds <u>1/</u>	Washington, D. C.	Yes	2-G-1
ME 4-17	Market potentials for Hawaii farm products	Honolulu, Hawaii	Yes	2-I-1
ME 4-18	Market potentials for hides and skins in alternative markets to leather	Washington, D. C.	No	
ME 4-19	Market potential for modified edible fats and oils <u>1/</u>	New Orleans, La. Washington, D. C.	Yes	2-G-4
ME 4-20	Market potentials for interfacial polymerized wool in textiles	Washington, D. C.	Yes	2-C-1
ME 4-21	Market potentials for sweetpotato flakes in selected markets	Baltimore, Md. New Orleans, La. Washington, D. C.	Yes	2-I-2
ME 4-22	Market potentials for cereal grain starch products in new industrial uses	Washington, D. C.	Yes	2-F-3
ME 4-23	Market potential for low-fat fluid milk	Washington, D. C.	Yes	2-A-1
ME 4-24	Market potentials for water-soluble gums and mucilages other than starch	Washington, D. C.	Yes	2-F-4
ME 4-25	Market analysis of the processing and marketing of maple syrup and other maple products	Pennsylvania State University	Yes	2-H-1
ME 4-26	An appraisal of the distribution practices and patterns of the domestic and territorial rice markets <u>1/</u>	Washington, D. C.	Yes	2-F-1
ME 4-27	Economic potential for crambe abyssinica as a new commercial farm crop	Washington, D. C.	Yes	2-J-2
ME 4-29	Market potentials for safflower oil <u>2/</u>	Washington, D. C.	Yes	2-G-3
ME 4-30	Market potential for modified beverage milk in the southeast United States <u>2/</u>	Clemson University	Yes	2-A-2
ME 4-31	Economic impact of innovations in food processing <u>2/</u>	Washington, D. C.	Yes	2-J-3
ME 4-32	Market potentials for hides with new product outlets, new marketing practices, methods of trimming, grading, and price <u>2/</u>	Washington, D. C.	Yes	2-B-1
ME 5	Evaluation of the effects of merchandising methods and practices on sales of and consumer demand for farm products			
ME 5-4	Evaluation of the sales effectiveness of a special promotional campaign for frozen concentrated orange juice	Washington, D. C. Florida New York	Yes	3-E-2

-Continued

1/ Discontinued during reporting year.

2/ Initiated during reporting year.



Line Project Check List -- Reporting Year October 1, 1963, through September 30, 1964--Continued

Work and project number	Work and line project titles	Work locations during past year	Line project incl. in	
			Summary of progress: (Yes-No)	Area and subheading
ME 5-8	Development of a statistical bulletin of household purchase and retail availability data for selected fruits and juices, 1950-1960	Washington, D. C. New York	No	
ME 5-9	Increased produce sales through improved merchandising in retail food stores	Washington, D. C.	Yes	3-E-1
ME 5-10	Evaluation of the long-term sales effects of advertising and promotion for Florida oranges and grapefruit <u>1/</u>	Washington, D. C.	Yes	3-E-5
ME 5-12	Evaluation of the effect of various promotional themes and techniques on sales of winter pears <u>1/</u>	Washington, D. C.	No	
ME 5-14	Economics of inventory control and space management in warehousing agricultural commodities	Washington, D. C.	Yes	3-H-5 3-O-1
ME 5-15	Improved methods of inventory control and space allocation for produce and frozen food departments of retail food stores <u>1/</u>	Washington, D. C. Massachusetts	Yes	3-H-4
ME 5-17	Sales effectiveness of selected advertising and promotion techniques for broilers	Washington, D. C. Ohio	Yes	3-C-1
ME 5-18	The impact of pricing policies, procurement, and merchandising practices of discount houses on conventional food distribution	Washington, D. C. New York	Yes	3-H-6
ME 5-19	Measurement of food stocks and nonconcentrated fluids in warehouses at the wholesale level of distribution	Washington, D. C.	Yes	3-H-2
ME 5-20	Appraisal of expenditures by agricultural producers for advertising, promotion, and public relations activities	Washington, D. C.	Yes	3-H-3
ME 5-21	Costs and returns of promotional investment on consumption of milk and its products	Washington, D. C.	Yes	3-A-1
ME 5-22	Market analysis and development of the desert citrus industry	Washington, D. C. Arizona	Yes	3-E-4
ME 5-23	Surveys of consumer purchases of fresh and processed fruit products in relation to consumer characteristics, type of retail outlets, geographic regions, and other market factors	Washington, D. C. New York	Yes	3-E-3
ME 5-24	Economics of pricing, merchandising, and labor utilization practices in retailing meat products	Washington, D. C. Ohio	Yes	3-B-1
ME 5-25	Measurement of food stocks and nonconcentrated fluids on inventory in away-from-home eating establishments	Washington, D. C.	Yes	3-H-2
ME 5-26	Evaluation of effects of weekly features on the retail sales of selected fresh commodities on sales of nonfeatured products and on store volume <u>2/</u>	Washington, D. C.	Yes	3-H-5

1/ Discontinued during reporting year.  
2/ Initiated during reporting year.

- Continued

Line Project Check List -- Reporting Year October 1, 1963, through September 30, 1964--Continued

Work and project number	Work and line project titles	Work locations during past year	Line project incl. in	
			Summary of progress (Yes-No)	Area and subheading
ME 5-27	Evaluation of the effects of various promotional themes and techniques on sales of fresh peaches	Washington, D. C. State of Washington	Yes	3-F-1
ME 5-28	Effect of variation of solids (sugars), in level of fresh oranges in retail sales <u>1/ 2/</u>	Washington, D. C.	No	
ME 5-29	Appraisal of the effectiveness of the Amsterdam Trade Fair Exhibition and Symposium on sales of American farm products <u>2/</u>	Washington, D. C.	Yes	3-H-7
ME 6	Distribution programs research			
ME 6-2	Evaluation of methods of distribution of federally donated commodities within States <u>1/</u>	Washington, D. C.	Yes	1-A-3
ME 6-4	Surveys and analyses of new food distribution programs for low-income households	Washington, D. C. St. Louis, Mo.	Yes	1-A-1
ME 6-5	Surveys and analyses of effect of food-stamp operations on sales of food in retail outlets	Washington, D. C. Louisiana	Yes	1-A-2
ME 6-6	Market for food in public and private schools	Washington, D. C.	Yes	1-B-1
ME 6-7	Study of consumption patterns of moderately high income families	Minnesota	Yes	1-D-2
ME 6-8	Surveys and analyses of commodity distribution programs for low-income households	Washington, D. C. Pensacola, Fla.	Yes	1-A-1
ME 6-9	Central food preparation and distribution in urban school systems	Washington, D. C.	Yes	1-B-2
ME 6-10	Evaluation of the institutional market for food	Washington, D. C.	Yes	1-D-1
ME 7	Transportation costs and services and their economic effect on agriculture			
ME 7-1	Economic research and consultation to meet current requests for information	Washington, D. C.	No	
ME 7-2	Development of statistics for the transportation bill and rail freight rate indexes	Washington, D. C.	Yes	5-C-1
ME 7-3	Transportation and Facilities Research Division cooperation in SM-11 project (rev.), transportation of grain and grain products in the South <u>1/</u>	Washington, D. C.	No	
ME 7-4 (Rev.)	Determination and analysis of costs of motor carriers engaged in the transportation of farm products	Washington, D. C.	No	
ME 7-5	Determination and appraisal of the nature and scope of operations of exempt, for-hire carriers and truck brokers in the movement of agricultural commodities <u>1/</u>	Washington, D. C.	No	

1/ Discontinued during reporting year.

2/ Initiated during reporting year.

-Continued

Line Project Check List -- Reporting Year October 1, 1963, through September 30, 1964--Continued

Work and project number	Work and line project titles	Work locations during past year	Line project incl. in	
			Summary of progress (Yes-No)	Area and subheading
ME 7-6	Economic appraisal of the transportation of fresh fruits and vegetables from California and Arizona to interstate markets	Washington, D. C.	Yes	5-B-1
ME 7-7	Alternative means to increase the flexibility and reduce the costs of railroad grain transportation services	Washington, D. C.	No	
ME 7-8	Analysis of economic possibilities of using air freight for moving agricultural commodities	Washington, D. C.	No	
ME 7-9	The movement of exempt agricultural commodities in interstate commerce by private motor carriers <u>1/</u>			
ME 7-10	Ocean freight rate series	Washington, D. C.	Yes	5-C-2
ME 7-11	Economic analysis of trends in the transportation of grain in the Northwest	Washington, D. C. Bozeman, Mont.	Yes	5-A-1
ME 7-12	Economic analysis of the grain transportation system in the Southwest	Washington, D. C.	Yes	5-A-1
ME 7-13	Effects of transportation changes on the structure of grain marketing and grain marketing firms (contributing project to NCM-30, "Grain Marketing Institutions and the Structure of Grain Markets")	Washington, D. C.	Yes	5-A-1
ME 7-14	Effect of transportation on the South's grain marketing structure <u>2/</u>	Washington, D. C.	No	
ME 8	Economics of marketing fibers and grains <u>3/</u>			
ME 3-19	Changes in quality of cotton bales during storage <u>1/</u>	Arizona	Yes	7-II-B-1
ME 3-73	Feasibility of cotton fabrics as bagging for American cotton <u>1/</u>	Washington, D. C.	Yes	7-II-A-3
ME 8-1	Charges and practices in marketing cotton	Washington, D. C.	Yes	7-II-C-1
ME 8-2	Marketing margins and costs for fibers and textiles	Washington, D. C.	Yes	7-II-C-2
ME 8-3	Price spreads and costs for grain and grain products	Washington, D. C.	Yes	7-III-C-1
ME 8-4	Marketing margins for fats and oils in selected consumer products	Washington, D. C.	Yes	7-IV-A-1
ME 8-5	Cotton ginning efficiency and cost	Arizona Mississippi	Yes	7-II-C-3
ME 8-6	Costs of operating grain elevators	Washington, D. C.	Yes	7-III-C-2
ME 8-7	Cost and efficiency of warehousing and related services for cotton	Washington, D. C.	Yes	7-II-C-4

1/ Discontinued during reporting year.  
2/ Initiated during reporting year.  
3/ Formerly a part of ME 3.

-Continued



Line Project Check List -- Reporting Year October 1, 1963, through September 30, 1964--Continued

Work and project number	Work and line project titles	Work locations during past year	Line project incl. in	
			Summary of progress (Yes-No)	Area and subheading
ME 8-8	Cost and efficiency in the operation of feed mixing plants	Washington, D. C.	Yes	7-III-C-3
ME 8-9	Structure and performance of the rice milling industry	Washington, D. C.	Yes	7-III-C-4
ME 8-10	Costs and efficiencies in bread distribution	California	Yes	7-III-C-1
ME 8-11	Labor utilization at cottonseed oil mills <u>1/</u>	Washington, D. C.	Yes	7-IV-A-2
ME 8-12	Cost and efficiency of grain storage and handling in the spring wheat area	Montana	Yes	7-III-C-2
ME 8-13	Economic evaluation of cotton quality	South Carolina	Yes	7-II-B-2
ME 8-14	An economic evaluation of alfalfa hay grading	Nevada	Yes	7-III-B-1
ME 8-15	Pricing cotton in relation to fiber properties	Washington, D. C.	Yes	7-II-A-1
ME 8-16	Central market quotations for cotton and factors affecting their adequacy <u>1/</u>	Washington, D. C.	Yes	7-II-D-1
ME 8-17	Influence of classification and market information services on wool prices to producers	Washington, D. C.	Yes	7-I-C-1
ME 8-18	Organization, operation, and efficiency of the marketing system for raw wool <u>2/</u>	Washington, D. C.	Yes	7-I-A-1
ME 8-19	Feasibility of grading, sorting, scouring, and baling wool in producing areas <u>1/</u>	Washington, D. C.	Yes	7-I-B-1
ME 8-20	Organization, operation, and efficiency of wool pools <u>1/</u>	Washington, D. C.	Yes	7-I-A-2
ME 8-21	Impacts of grain banks on feed milling and farming	Indiana	Yes	7-III-C-5
ME 8-22	Changing structure and performance of the Northeastern markets for grain	Maryland	Yes	7-III-A-1
ME 8-23	Industry structure and costs of storing sorghum grains in commercial elevators	Texas	Yes	7-III-A-2
ME 8-24	Marketing and the use of cotton waste <u>2/</u>	Mississippi	Yes	7-II-A-2

1/ Discontinued during reporting year.

2/ Initiated during reporting year.



